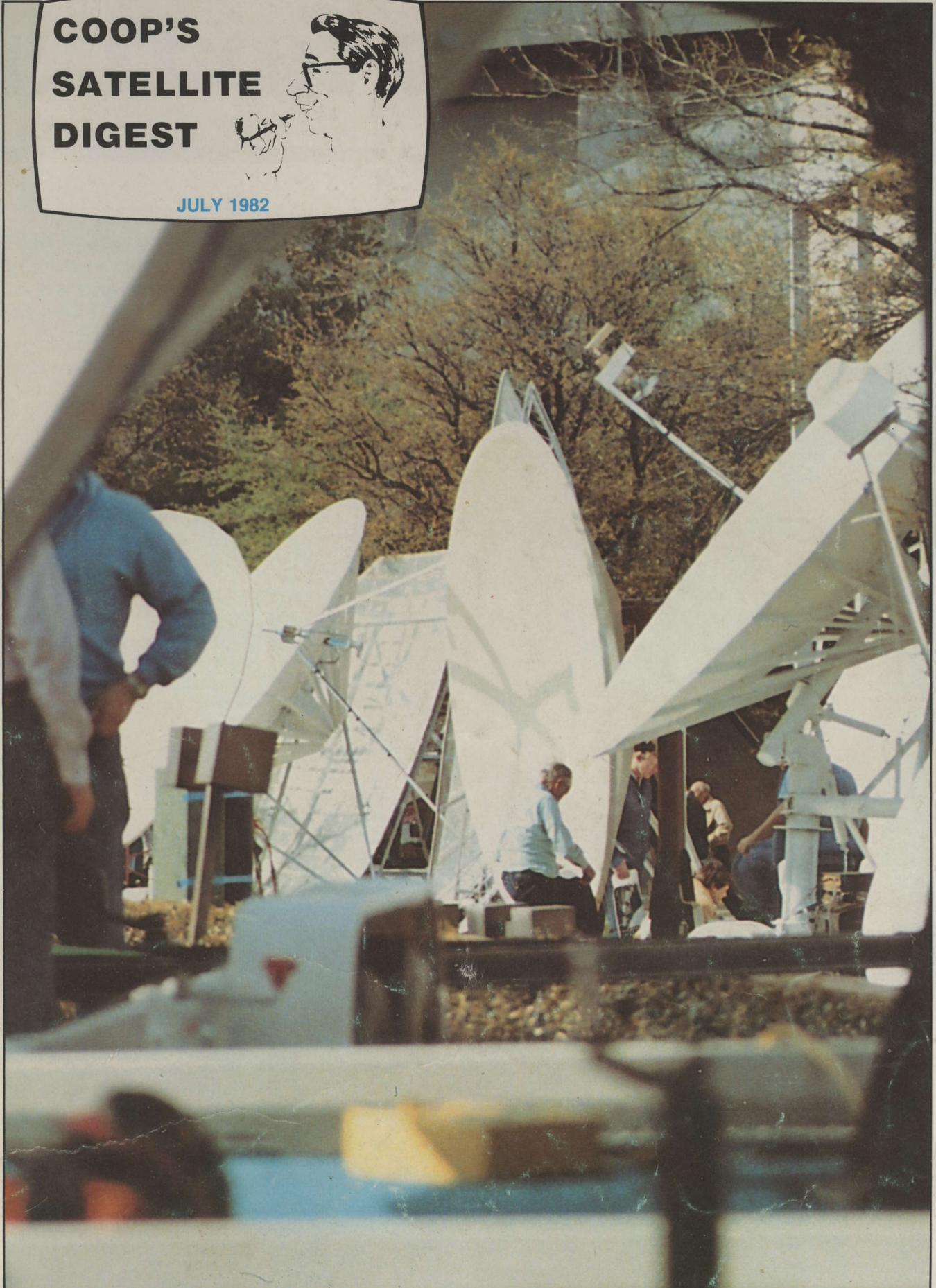


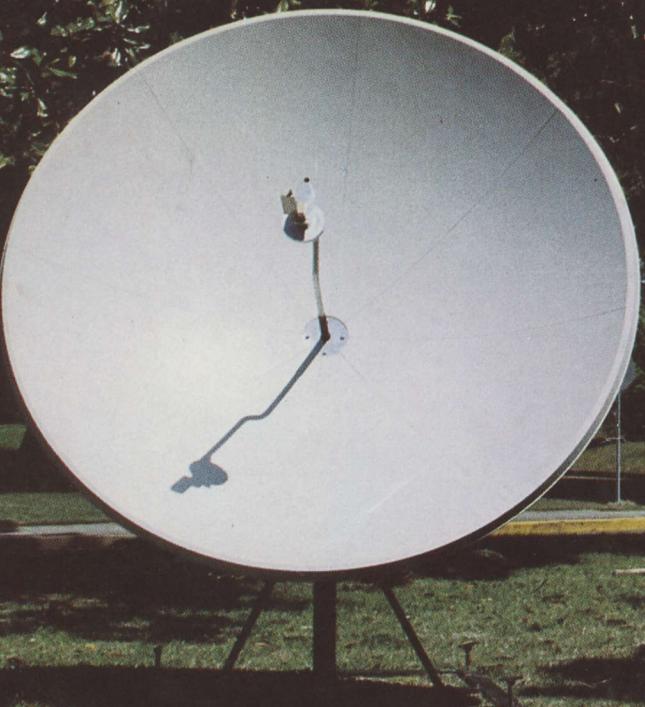
**COOP'S  
SATELLITE  
DIGEST**



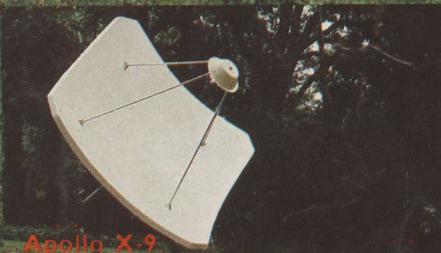
JULY 1982



# We'll pay to find out.



**Apollo X-10**



**Apollo X-9**



**Amplica R-10 Tuner**



**Microdesign Receiver**



**Apollo Z-1 Tuner**

If your company buys or sells satellite receiving equipment and it's not Apollo™, we'd like to know the reason why.

National Microtech supplies more satellite TV antenna systems than anyone in the world—we've got to have some **good** reasons why! In fact, you're looking at some of the world's best satellite TV equipment on this page.

Our new Apollo Z-1 and our Amplica R-10 both use an LNC instead of the old-fashioned LNA—and both tuners interface to change the polarity electronically (no rotor) and aim the antenna remotely.

The Microdesign receiver has a wireless remote control with memory for channel, polarity, and antenna aiming interface.

The new Apollo X-10 antenna is made of **precision** injected fiberglass panels that are guaranteed to match perfectly. The performance of the Apollo X-10 at 4 and 12 GHz is the best of the 3 meter dishes we've seen in the industry.

Our equipment makes good sense, and our prices are world class. We'll gladly pay for your call to find out the reasons why you're not using National Microtech's equipment...and we'll promise you some good reasons why you should. Call today **TOLL FREE**.



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While most major sporting events and movies can be received on Apollo systems, National Microtech cannot sell or transfer the viewing rights.

## TOP OF THE MONTH

**THERE ARE SEVERAL** pointed examples in this month's **CSD** conveying the message that the home TVRO revolution is becoming quite an international phenomenon. Steve Birkill describes the installation of the first TVRO commercial dealer terminal in London (and the UK), and, there is some fantastic news about the availability of F3R and W4 signals on **some** transponders on (relatively speaking) small antennas in (northern) South America.

**THE WESTAR 4** report (see Coop's Satellite Comment) is intriguing because an identical bird (Westar 5) is scheduled for service (if the launch due at press time went well) by mid to late July. The W4 orbit position would not be **expected** to do any coverage favors to northern South America; the W5 orbit position (123 west), however, always looked quite good for northern South America. The 'unexpected' results with W4 has many satellite antenna system designers scratching their heads; it was NOT supposed to happen this way.

**ALSO** in this issue is a brief report on how American television stations (and networks) have suddenly discovered they can rent space-time on Russia's Ghorizont bird(s), bypassing the far more costly Intelsat. It happened several times in May, and if you think that hasn't caused a furor . . . well, read about it.

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### OUR COVER—

The forest of antennas at the recent **SPTS/NSOC** in Fort Worth reminds us that upcoming early in August is the next industry gathering; the Omaha (first) Annual conference and trade show for SPACE.

**COOP'S  
SATELLITE  
DIGEST**



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## COOP'S SATELLITE COMMENT

- SENATOR GOLDWATER
- F3R, W4 BIG IN S.A.
- NETWORK UPHEAVAL COMING?

### RECEIVER PATENTS/Revisited

One of my earliest friends in the satellite hardware business was 'young' David Alvarez, who works for Microdyne. David and I put a lot of antennas together in a lot of strange parking lots in the 1976-1978 era; he to show off Microdyne equipment, and me because the parking lot was there and the work had to be done.

We wrote about Microdyne, and its receiver patents, in the May issue of **CSD**. I noted that Microdyne had written letters putting numerous manufacturers of TVRO receivers 'on notice'; that notice being that Microdyne had several hard won patents on various demodulator and receiver techniques. Microdyne didn't want anyone copying their circuits. You can't blame them for that.

Shortly after the May issue came out, I received a telephone call from David. "How is the five meter (AFC/Microdyne) dish working?" he asked. I told him it was our dedicated F3R dish and was holding up fine. "You build a fine antenna; two years of salt spray and being on the beach, and it is still like new!". I knew he wasn't calling to ask me about my dish.

"Say, I read in the May CSD that you are concerned that Microdyne corporate minds may be about to jump on some home industry receiver manufacturers for perhaps lifting some of our patented circuits." I knew that was why he was calling.

David, speaking I suppose for Microdyne, makes the point that a patent is only good if you protect it. I made the reverse point that it was a little bit like having an FCC license for a TVRO; you retain protection from terrestrial interference only if you constantly check to see who is planning to build a microwave transmitter near you.

"Our attorney told us that we had to put everyone in the industry on notice that we have certain patent rights; that if we fail to do that, either selectively or as a group action, we will in effect give up our patent rights. We have to vigorously pursue them all of the time, or they will be lost."

"If we know about someone infringing on our patent, and we don't put them on notice that they are infringing, we have just lost our right to protect our patent with that firm. If we don't know about it, and somebody copies a patented circuit, and they get it into the marketplace, we may still lose our patent rights."

We wondered if Microdyne was about to bring suit against anyone in the private industry. We had AVCOM in the back of our mind since way back in the beginning, there had been some hostility between Microdyne and AVCOM.

"We believe that back in 1980, or so, AVCOM may have come very close to our circuits in some of their (early) receivers. What I have seen of their current product is not similar to our patented circuits."

Did that mean that they were not planning to jump on Andy Hatfield?

"We sent AVCOM a letter, along with many others. If, after they have received that letter, we find they are continuing to make a product which appears to have some of our patented circuits in it, then we would have to take action." I said I could not and would not presume to speak for Andy Hatfield, but I really doubted Andy would 'step backward' to a receiver design he abandoned in 1980. David laughed.

"There are so many receiver manufacturers out there now, that we can't even begin to keep track of them all" David noted. "I admit we just rounded up all of the names of receiver manufacturers we could find, and where we didn't know what type of receiver demodulators were being used, we fired off a letter." That explained to me why the 564 people didn't get any letters. A Microdyne receiver does not, and never has used, a 564 demod!

Was there some firm out there which Microdyne was concerned about? Some firm which they felt was continuing to lift their circuits, even after being put on notice? There was, but David asked that we go off the record and I respect that request. I will note that if your firm received a letter from Microdyne, and your engineering people admit they may be using a delay line demodulator, you had better consider what could happen if you had to go to court with Microdyne. As David said earlier, "If we don't protect our patents, we will lose them."

### STEVE BIRKILL/ and I

I first heard about Steve Birkill in 1976. An English reader of **CATJ** had written to tell about a chap up in Sheffield (England) who was watching the American ATS-6 satellite, on loan to India. Using home-brew 2.6 Ghz receiving equipment, the Sheffield chap was getting good TVRO pictures on a small dish. Naturally I made contact with Mr. Birkill.

In 1978, when **CATJ** was co-sponsoring a national cable television trade show in Oklahoma, and we were planning to 'uplink' about 20 hours of the trade show technical sessions back through RCA's F2 to cable technicians and engineers spread all over the USA (and Canada, it would turn out), I arranged to bring Steve Birkill to Oklahoma to speak before the group and to share his knowledge on low cost terminals. This was at a time when Taylor Howard was still operating incognito in California, Bob Coleman was trying to get his first TD-2 surplus system to work, and 'the rat pack' consisted of people such as Canada's Rod Wheeler, the infamous Steve Richey (designer of the very first, in-production, home TVRO receiver; see **CSD** for June, 1980) and myself.

I have previously written that Birkill and Richey didn't get along too well. I have also written how Birkill, upon arriving in the states, proceeded to take Richey, Wheeler and myself into my basement shop one evening and hook up a small PC board which he had wired that day at Richey's shop, and hooking into the 70 MHz IF of a Microdyne receiver, demodulate video. This was the first US demonstration of the 564 demodulator, and thanks to Birkill's genius dozens (hundreds?) of firms and tens of thousands of low cost home receivers would end up in the marketplace. Signetics (originator of the 564) should have given Birkill a platinum 564 for his efforts. Sadly, they probably don't even know his name.

Well, most everyone else in the TVRO industry knows Steve Birkill's name. Before I sold **CATJ**, I got Birkill to agree to write a monthly column for that magazine. His column there continues to this day, although he is now forced to deal with editorial people who have little feeling for home terminals and no technical background at all. They allow his column to continue because it buys them perhaps 2,000 extra subscriptions per year to **CATJ**, and that is not a bad

trade.

Last summer I saw Birkill in Tulsa, Oklahoma. He came over to meet with David MacZura of SatFinder and Keith Anderson of South Dakota. Anderson had created the super low-cost TVRO receiver that block down converted the 3.7 to 4.2 GHz band down to roughly 400 to 900 MHz, and then Anderson had found a way to spend someplace around \$15 on parts to modify **any** TV set known to turn it into a TVRO receiver. SatFinder had purchased the rights to Anderson's invention, and Birkill was being asked to take over as Director of Engineering for SatFinder. SatFinder was planning to market the system in two versions; one that would allow a single antenna/downconverter combination to feed an unlimited number of homes, via cable interconnection (in the UHF TV band), and, one that would take the 400-900 MHz band as a 'block,' and retransmit it through the air to surrounding homes. Each home would have a small UHF antenna, and a TV receiver that was modified with the \$15 in parts.

Birkill was, as I recall, very skeptical of the system. He brought with him a wealth of experience in TVRO system design, plus, the unusual double ability of being in the top of the engineering family at the BBC. In fact, Birkill had designed and prototyped low and medium power BBC UHF television translators and transmitters and amplifiers. Much of rural England today watches television via UHF 'repeaters' designed in part or in whole by Birkill.

Anderson had none of the Birkill credentials, but he had been the fellow who developed the first solid state (transistorized) TV translator, and Keith has 'magic fingers.' He could poke his hand into a circuit and tell you what is wrong with it, or make it right by moving a piece of wire a fraction of an inch.

David MacZura was very nervous as they set up the system in his backyard for Birkill. Steve and Carole Birkill had been brought over a couple of days early, and Larry James of SatFinder had carefully kept the Birkill's occupied while Anderson set up the demo and the Coopers arrived from the islands. Susan and I had been invited in primarily because we had put Anderson and MacZura together, initially, and because Birkill had agreed to come over at my request.

The system worked, but not as well as it had a month earlier when I flew to South Dakota with the SatFinder crew to initially inspect Anderson's work. Birkill liked what he saw well enough to agree to enter into negotiations with MacZura, to leave the BBC, and come to work for SatFinder.

For Steve Birkill, it was the answer to five years of trying to find the **right** type of environment to suit his unique abilities. Here was leading edge TVRO technology, UHF solid state amplifier technology, a fast moving, rapidly growing company with a brand new 25,000 square foot building under construction, and a company president that listened to what you wanted, and then said '**OK — let's do it!**'

This past May 17th after 11 months of grueling paperwork and endless forms and interviews, the Birkill family was accorded UK permission to come to the United States. To work for David MacZura, and SatFinder. Birkill, responding to an agreement with MacZura, had been ready to leave the UK since last August first; the day his multi-year employment with the BBC ended with a Birkill penned resignation.

On or about May 18th, Birkill was notified that SatFinder had closed its doors. For reasons private and personal to those involved, there was no more SatFinder. And because the Birkill 11 month negotiations to come to the US were built around a **specific** employment opportunity from a **specific** US company, all of those forms and all of those interviews and all of that waiting was for naught.

There is a tremendous irony in all of this. Taylor Howard's first manual-described receiver made the transition from laboratory curiosities to work bench duplication largely because of Birkill's 564 demod. Birkill had willingly shared that demod in his early **CATJ** columns. More than half the receivers you see advertised in **this** issue of **CSD**, in turn, 'borrowed' from Taylor Howard's 'original' technology.

While we sit here wondering **who** will be the first to develop the first work-bench-repeatable 12 GHz terminal hardware, Birkill has been watching OTS 12 GHz transmission in Europe with a homebrew system he had ready to go before OTS even turned on their first test transmission.

While we sit here trying to figure **which** bird Saudi Arabia is transmitting on (figure that out and then TRY to find their audio!!!), so we can give guidance to our newly developing African and Asia readers, Steve Birkill has carefully and studiously developed a transponder by transponder, bird by bird carrier and sub-carrier catalog which probably is more complete than any such study in the world. (Saudi TV sound, to answer the prior question, is found on hemispheric transponder 5, wide-band FM, sandwiched between two radio program feeds!)

The 'arrangement' MacZura worked out with Birkill was, by **present** industry standards, very 'modest.' Birkill was to receive \$50,000 per year, a place to live, a SatFinder dish system at home, some transportation, and a laboratory to work in. I helped Steve put together a list of the lab equipment and later helped Larry James price it out. It came to \$150,000 or so (most of which would have been leased from firms that specialize in such things). And a profit sharing program. That was it.

There are some executives in this industry reading this who earn twice as much per year; two years ago they couldn't spell TVRO. I don't begrudge them their income levels, only wonder about priorities. Taylor Howard told me recently that he has long felt that Steve Birkill and he should have reversed roles; **Steve should have been** in the states, where the opportunities allow you to grow as far as your abilities will take you. "**Steve would have been the Arthur C. Clarke of home satellite terminals**" Taylor offered. If you are reading this and don't know who Arthur C. Clarke is, you need to order a set of **CSD** Anthologies!

I have no way of knowing where all of this may be, by July 3rd or so, when many of you will be reading this copy. Steve may be in the states, but I doubt it. Someplace out there, there is a firm like SatFinder was a year ago, with an aggressive young President like David MacZura. And they are reading this saying to themselves 'Boy, we could set this whole damn industry on its ear with a guy like Birkill on our team!'

**Don't call me.** Don't call Steve Birkill (no, I won't give out his telephone number!). Don't call anyone unless you are ready to make up for the bitter disappointment Birkill has faced after 11 months of waiting, and hoping, and itching to jump into the most exciting commercial industry of our lifetimes. **Then**, if you can **honestly** say that you can handle **all** of this and Steve Birkill, call Rick Schneringer at STTI (405/396-2574) and Rick will hear you out. If Rick decides you are for real, he'll put you in contact with Birkill, wherever he may be at this point in time.

Oh yes. Steve Birkill writes in **CSD** this month. Steve has agreed to write for me again **every** month, and if the mails don't get us down, we'll see more of Birkill with an accent on the 'leading edge' of TVRO technology next month as well. And that goes with the deal; if Steve does, finally, come to North America, he'll continue to work with me here at **CSD** to develop not only a new regular monthly feature, but a number of other interesting 'publishable' products. It is about time, no, well past time, that we as an industry (as Taylor Howard said to me) "Finally recognize that Birkill is the **one guy** who has made all of this possible for the rest of us!"

#### GUIDE FREAK

Poor Ed Hegner probably wonders how the Coopers have time to browse through all of the reading material he flies down here for us in his Beech D-18; much less read it. The whole family reads voraciously. I specialize in TV guides (with a small 'g') and in our business that largely means satellite guides (with small 's' and 'g'). I think every week or so, somebody brings out a new one.

I keep looking for the 'perfect guide.' I have no special thoughts on how you put together a 'perfect guide' but I'll know it when I see it. The first test it has to pass is that I can read it, understand it, and use it in less time than it takes for the program chosen to run on the air. Right now, after I check every guide I get, to determine what is actually up there for any given point in time, the program is either half over, or I spend the last half of the prior program splitting my interest between the program on the screen, and figuring out where I go next. Since I am doing this not for my own television viewing (I watch

## HOME TVRO TERMINALS COME TO UK

### Bringing Moscow to London

Live Moscow TV first appeared in public on a British TV screen towards the end of 1981. Mack Palomäki, a Swedish enthusiast, had seen U.S. home TVRO terminals on a visit to the States in 1980. Hearing of my own work with Soviet satellites, he bought an American system and took it home to Sweden, to assess the commercial possibilities for Russian TV in Europe. He soon learned how to put together the terminal and began to promote Soviet television as the best (and only) thing to hit Swedish tubes since Swedish television.

Mack succeeded in attracting a great deal of publicity in Sweden, and word reached the ears of Nik Powell, flamboyant record company boss in London. Nik's latest mega-project was an all-singing, all-dancing video retail establishment called The Video Palace, in London's once-fashionable Kensington High Street. Nik wanted to pull off a real coup for the grand opening of his store, and saw satellite TV as the answer. He employed a bright young salesman, Jeremy de Sausmarez, to organize a display of satellite TV incorporating the Palomäki terminal, which he agreed to purchase as a demonstration unit, to attract orders for more systems.

Jeremy saw little point in buying American equipment via Sweden for the operation, but went ahead anyway. Aware of a lack of technical support he contacted me for advice on the installation. Since I understood that the US-made equipment was not being modified to be fully compatible with the Soviet signals, I preferred not to be associated with the results. Instead I suggested they mount a second demonstration terminal, to receive their own promotional material transmitted via Europe's experimental OTS (Orbital Test Satellite) in the 11 GHz band. Jeremy followed my suggestion, and began to organize the second system. I was to provide the 11 GHz LNC and receiver. Andrew Antennas offered free use of a three-meter antenna. The Bavarian earth station agreed to uplink our promotional program free of charge, and Eutelsat (the OTS governing body) said they would make the satellite transponder available without charge for a series of one-hour transmissions, **provided** we had the agreement of British Telecom (our national "Ma Bell"), and the Home Office (performing the function of licensing body, like the FCC). This proved to be the problem. The European telecommunications authorities are over-anxious to protect their virtual monopoly situation. And the British

### Editor's Note:

In the June issue of CSD we carried a report from England's Steve Birkill on the operational status of various Atlantic and Indian (Ocean) region Intelsat and Russian family birds. As Birkill pioneered home TVRO's world wide, he has at last been able to see that interest mature in his home country. This sometimes satirical report tells us how the very first commercial seller of home TVROs in the UK recently went into business.

by  
 S.J. Birkill  
 Sheffield  
 United Kingdom

government sees anything which appears to threaten the established broadcasting duopoly in these islands as the first step towards anarchy.

Boldly, Jeremy approached the authorities and requested a license to **receive** this promotional transmission. "**Very irregular**" said the man when eventually he understood what our hero wanted to do. "You must first apply for use of our own facilities. If we can provide them, the cost to you will be in the region of \$10,000." "Oh," thought our friend, "That's a lot. Why can't I use **my own** terminal, which will not cost me anything?" "It's not our policy to license private terminals" came the reply, "and in any case you'd need frequency co-ordination which would take several months, even if we thought your site suitable." "But I shall only be receiving, not transmitting" said our man, "and any interference at the site will only bother **me** — I'm quite prepared to take that chance." "Not so fast" cried the official. "We have to be sure the satellite signal will not **damage** anything on the way down into London." He offered no explanation why the city had not been reduced to rubble by four years of tests through the OTS Euro-spot transponders. Our man limped home, nursing his bruises. A week later the Video Palace opening shindig went off as scheduled, **without** an 11 GHz terminal.

Mack had arrived in London that week, towing a trailer bearing a rather worse for wear 2-meter dish; ex-Swedish Telecom. It was his second attempt, the first antenna having been reduced to a crumpled heap by cross-winds on a highway somewhere in Holland. Jeremy had to hurtle out to Dover to help Mack through customs with this unlikely load, but at least it diverted the officials from the electronic hardware he was carrying in the trunk of the car!

Soviet TV didn't look too good in Kensington High Street. The Gorizont-4 3675 MHz spot beam carrying the 'Moskva' service had a beginning-of-life EIRP around 41 dBW to London, in summer 1980, but by fall '81 its power had dropped to some 36 dBW. This would not have been too bad, but Mack's American domsat receiver did not fully remove the wide, slow energy dispersal waveform used by the Russians on their high-power spot beams, so twice per second, on the dispersal peaks, up came the sparklies. Added to this was the fact that, despite efforts to persuade him, the Swedish satellite chef was not adding a dash of audio processing, to his receivers, to restore the compressed dynamic range employed as a noise reduction measure by the Soviets.

But for Powell it was (he thought) a gold mine. He formed a new company, **Megasat**, to market all types of satellite TV, based on the 2-meter 4 GHz terminal. Jeremy was 'promoted' to another part of the Video Palace operation, and Graham Lawson, fresh from producing 'punk rock' records, became Magasat's front man. The team made numerous press and TV appearances, and certain extravagant claims were attributed to them. Did you hear the one about the Russian propaganda channel having taken over from 'Moscow-1,' beamed to the U.K. and subtitled in English? **Contrary** to what they say, **it hasn't happened yet**. Or, about all the different channels of Russian, French, Spanish and African TV a 4 GHz 2-meter, 120°K terminal will receive, in color, as well as 'being ready' for 12 GHz DBS. About Saudi Arabia **not** leasing an Intelsat transponder. Or maybe it was all the embassies, universities, TV stations and newspapers already operating Megasat terminals. There were not many people in the U.K. who knew enough about satellite TV to put these claims in perspective, so it **was** dismaying to encounter them in the public information media.

**Sonic Sound Audio Holdings PLC** is a video retailer. A public company, listed on the London Stock Exchange, Sonic Sound owns most of the video stores in Tottenham Court Road, London's international marketplace for consumer audio and video equipment. Their chairman, Lionel Astor, had seen home satellite systems in the USA. And he'd watched the Megasat operation, and seen their results. He wanted his company to be the first to offer a **fully-engineered** satellite TV reception system in the U.K., as a consumer product.

Unlike many who take US domsat TVRO hardware outside the USA, Sonic Sound knew in advance exactly what their installation would deliver. And they knew they needed to be able to respond to orders with a firm delivery date, and that engineering backup was essential. I was able to advise them what was needed, having monitored all the various types of 4 GHz satellite TV signals reaching the U.K., since the summer of 1977. At end of life, the Gorizont spot beam

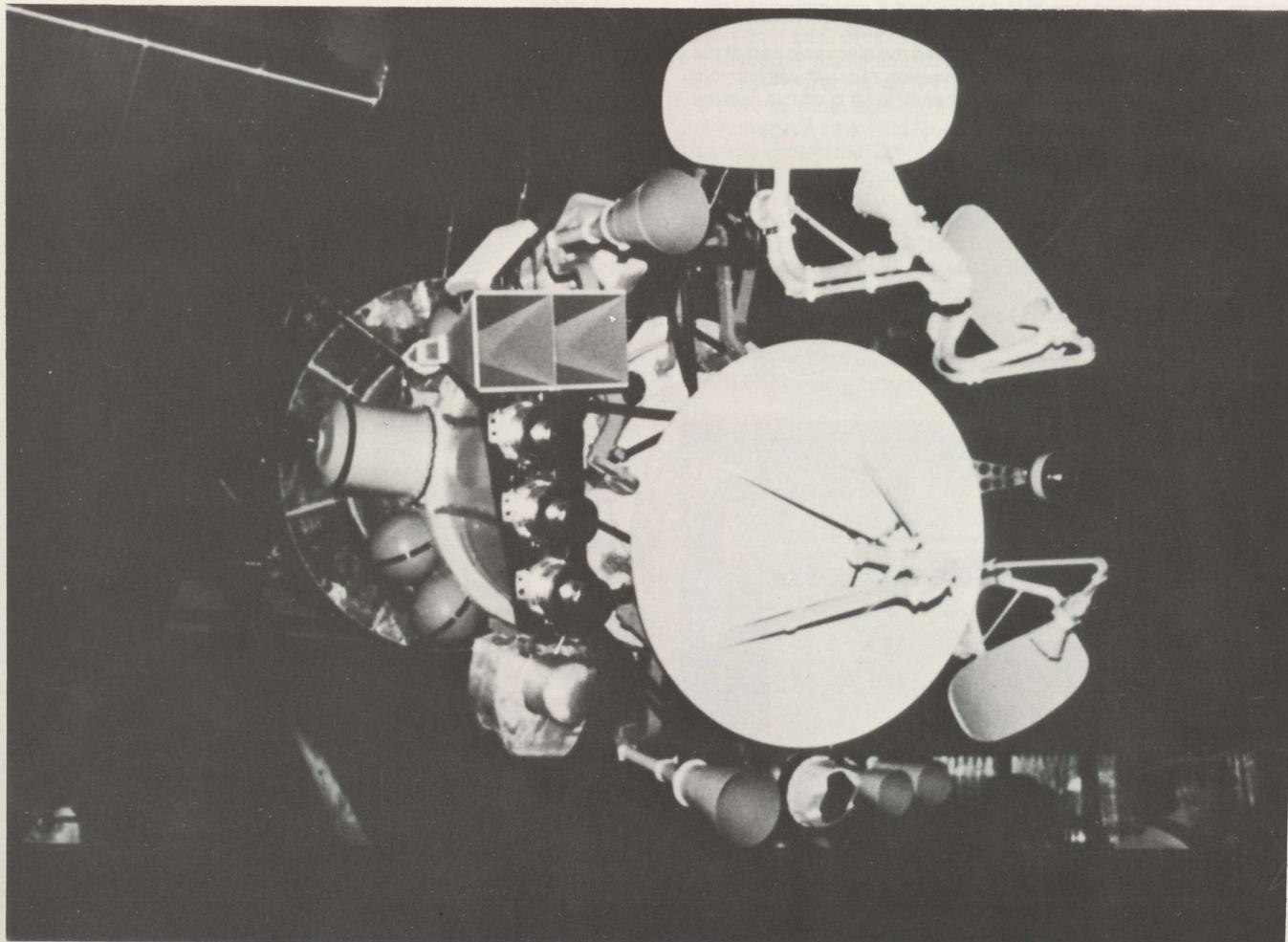
spillover in London required a 2-meter 100°K or a 2.4-meter 120°K system, for sparkle-free pictures. Beginning-of-life EIRPs had enabled (and would enable) a 1.5-meter antenna to exceed threshold on the spot beam signal, **with** the correct dispersal-cancellation circuit. But to ensure customer satisfaction, the end-of-(satellite)-life condition had to be met, and then with some margin. For the marketable product, the 2.4-meter, 120°K system was selected: a supply of good spun aluminum 8-foot dishes at a very good price would prove to serve this requirement well.

But, for the demonstration terminal, it would help to have more than the one (spot-beam) channel available. My estimates indicated that the other two permanent TV transponders on the Atlantic Gorizont satellite, with hemi/zone and global beam footprints, would be brought at least to threshold by a 3-meter, 100°K system. These channels do not carry a full-time Moscow program service (like the spot beam) but can be of considerable interest; the 3825 MHz 'spare' channel being used for unilaterals, remote sports event feeds, or occasional relays of the other Moscow programs such as II-Programma or Orbita-III Vostok, and the 'global' 3875 MHz channel being the Intersputnik vehicle, with all manner of program exchanges between Soviet bloc countries, including Cuba, and some west European content too. The other Russian systems with hemi or global beams (Statsionar-2/Raduga-9 at 35°E, Statsionar-5/Gorizont-3 at 53°E and the inclined orbit Molniya-3 birds) would likewise be close to threshold on such an installation.

Antenna size would have to be increased considerably to gain more channels: French TV via Symphonie is some 6 dB below Soviet global beam levels in London, due to its transponder backoff, and its three-degree orbital inclination **demands** auto-tracking. Almost as strong are the full-transponder and enhanced half-transponder Intelsat global leases, operating now on Intelsat IVA hemispheric transponders, for Saudi Arabia and the Sudan. But again, if **marketable** video was to be recovered, I could not recommend anything smaller than six meters for these, in England. Further down the EIRP scale are the Atlantic leases of Spain, Zaire and Niger, and the Indian Ocean leases of Algeria, Nigeria and Oman, though these last have the disadvantage of a very low elevation angle (less than ten degrees) from London. Although **results** of a kind can be obtained with quite modest equipment, I would have had to specify an antenna in the nine-meter class for these weaker Intelsat channels, if full entertainment-value pictures were required.

Sonic Sound considered my detailed report, and, while deciding to look into the possibility of a remote site as a 'dish farm' equipped for Intelsat reception, they agreed that the 3-meter size was optimum for demonstration purposes, especially since their chosen site was a rooftop in central London.

Now, it was immediately apparent that we would encounter a considerable amount of terrestrial microwave interference, especially considering that the London Telecom Tower, **the hub** of the nation's 2, 4, 6 and 11 GHz telecommunications network, festooned with horns



**GHORIZONT** (Gorizont) - as seen at a Paris Air Show in 1979 (photo courtesy of D.J. Hawkins). Steve Birkill suggests the large dish (center-right) could be for the European 'spot beam'. The sectorial paraboloid (upper, center) would possibly be for a northern hemispheric beam and the conical horn (left, center) for Global beam. The smaller sectorial paraboloids may be for the military 7 GHz transponders. The large, square horns are a mystery at the moment.

and dishes looking in almost every conceivable direction, rose majestically 600 ft. above the rooftops **not a half mile from our proposed site**. Consultation with British Telecom revealed that the Soviet spot-beam channel, centered on 3675 MHz, was gratifyingly clear of any Telecom frequencies, but that interfering carriers could be expected throughout the 3.8 to 4.2 GHz region of the downlink band. Acting on this information, we went ahead with the installation, secure in the knowledge that our principal channel would be clear of interference, but with a strong possibility that other transponders would be unusable.

When asked to recommend a 3-meter antenna and mount, I volunteered the information that the SatFinder was the best-engineered of the single-user systems I had seen; that with a slight modification it could give perfect geostationary orbit tracking; but that, being a quality product, it was not the cheapest in the field. Sonic Sound's Mike Aarons, who was to become their satellite division director, liked the idea of a single-axis (polar mount) steerable antenna. But with only one high-power 4 GHz satellite TV channel at present they opted for the hand-cranked rather than the motorized version. These guys knew what they wanted, and they wanted it immediately. A British outfit had a new but untried 2-meter reflector available at what seemed an impossibly low price, but Aarons wanted the SatFinder for the Sonic Sound roof, and with David MacZura's help he arranged for the three-meter system, including mount, to be shipped out of Tulsa, Oklahoma by air that very day, bound for London. It meant that they paid more in freight charges than the cost of the antenna, but the result was that Aarons had it assembled at Sonic Sound's London warehouse just over a week later.

I had by this time obtained and modified the electronic part of the installation. I had specified a dual-conversion receiver with remote downconverter, and the one which happened to be available was the

'Entertainer' by Satellite Supplies Inc. This turned out to be a single-board unit, manufactured in Korea, and was immediately recognizable as a descendant in direct line from the first Tay Howard home TVRO receiver. The downconverter was nicely made and weatherproofed in a very solid aluminum alloy box, with remotely tuned VTO and head amplification provided at the first IF, approximately 850 MHz. The demodulator was of the encapsulated hybrid divide-by-two-and-PLL type, otherwise it was virtually identical to the early SATRX and similar receivers. Styling a little old-fashioned, very American, not quite the sleek hi-tech look that wins admirers in the audio and video stores of London's West End.

But with a little attention it worked well enough — especially considering its demodulator design, and the wide deviation values employed by the Soviets. The mains transformer was changed for one with a 240-volt primary. Video de-emphasis components were changed to give the 625-line CCIR characteristic. Video filtering was modified to improve response. A trimmer pot was added to give fine adjustment of PLL tracking range, and eliminate 'sparkly-edges' on the test card. The AFC loop was adapted to incorporate controlled frequency feedback to handle the Russian dispersal. Video output was changed to give a true 75-ohm source impedance. Audio demodulators were retuned to 7.0 and 7.5 MHz, and the Birkill pilot-tone expander module was inserted in the 7.0 MHz output. A variable-gain IF pre-amp was fitted, to cope with the 500-foot cable run from the roof to the showroom. And a channel 36 UHF modulator, to enable the output to be viewed on a standard British TV, as well as on monitors, was added.

The LNA was the compact Dexcel MIC type — a selected 120°K unit — and the feed a standard Chaparral with quarter-wave vane added for circular polarization. The whole system was proved and aligned on my own 8-foot antenna — the first American TVRO hard-



250 FEET ABOVE — a London street, Sonic Sound's 3 meter SatFinder antenna system looks towards a Russian satellite above the Atlantic ocean; while to left, British Telecom Tower puts up stiff 'terrestrial' opposition.

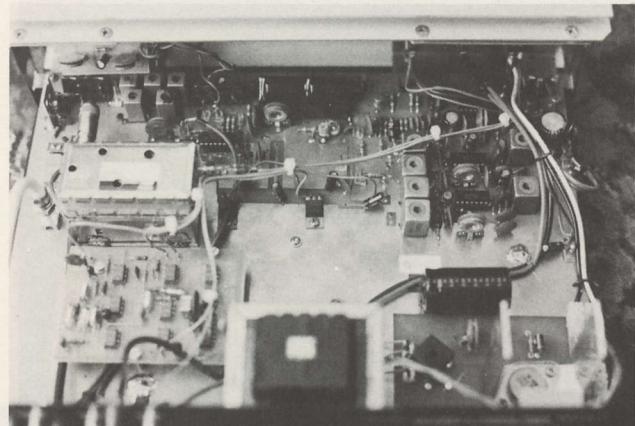
ware to operate at this location.

The roof of the building offered a spectacular view out across London. The only higher points within a half-mile radius appeared to be the pesty Telecom Tower to our north-west, and the giant 36-storey Centre Point block, south-east of us. The top of Centre Point had an elevation angle of almost 20 degrees, but it was well below the geostationary arc at that point. From the dome of Saint Paul's Cathedral and the NatWest Tower, and Barbican in the east, up over the Shell Centre, Nelson's Column, Big Ben and the Houses of Parliament in the South, round over Battersea Power Station and the London Hilton to the western horizon; almost 150 degrees of Clarke Orbit were in view. A location was chosen on one of the two elevator motor housings, the highest points on the building, and the Thorn-EMI people set about providing steel girder work anchored to the building frame as a foundation, while cables were run through the building's warren of ducts, to ground-floor level, where the receiver was to be displayed.

As soon as the foundation was complete, a day was fixed for the installation. April 22 dawned a warm, dry day with light winds and hazy sunshine — unusually fine for this time of year. The morning saw assembly of the mount and antenna onto the prepared base, under Mike Aaron's direction, while I drove the 180 miles down from Sheffield (the Londoners say "up" from Sheffield) with the electronics and some test gear. I drove straight to Tottenham Court Road where I was met by Mike Aarons, who conducted me to the private underground parking place he had reserved — a precious resource in central London! The news was that the antenna was fully assembled in place, and that the cables were laid, but not terminated. A cup of tea later we were 15 storeys up, looking down on the crowds, the taxicabs and the red London buses in the street below. The 3-meter antenna stood proudly on its own raised dais, visible for miles around. We were able also to make out **two other** rooftop satellite terminals, that of **Satellite Television PLC**, monitoring their **11 GHz OTS** transmissions to Europe, and a **British Telecom** data communications terminal on London University, also looking at OTS which, coincidentally was that week in the course of moving station from  $10^{\circ}\text{E}$  to  $5^{\circ}\text{E}$ , to make way for its operational replacement ECS, the European Communications Satellite.

First to check the mount alignment. The contractors had marked a 'north/south' line on the base, but Mike's quick solar transit check at local noon had shown it to be in error by a massive fifteen degrees. Perhaps they had left British Summer Time out of their calculations. But this was not a problem, due to the excellent orientation adjustment provided on the SatFinder. With the aid of an Ordnance Survey map and a makeshift theodolite, bearings were taken on the two TV broadcasting towers, just visible through the haze, seven miles away in South London, and the mount adjusted to true north/south alignment. Setting the polar axis was less straightforward, as it was not possible with the unmodified SatFinder to achieve the required declination offset of 6.78 degrees between antenna plane and polar axis, as required for optimum tracking at latitude  $51.52^{\circ}\text{N}$ . So a compromise setting was reached, with some four degrees offset, and the polar axis inclined to a value between true polar and modified polar. This was nevertheless to prove acceptable.

The actuator was attached in the 'eastern sky' position while the LNA and feed horn were fitted, but it was decided to look at our primary target first. Cranking hard against the westerly stop, I figured we should be close to the  $14^{\circ}\text{W}$  bird. My antiquated narrow-band receiver with built-in spectrum analyzer (the one that reinserts syncs, and the little rectangular ident at top left, which you'll have seen on many off-screen shots) had been hauled up to the roof and was now powered, and, a portable color monitor connected. The extent of the opposition was now revealed. At 30 MHz intervals throughout the upper four-fifths of the band were carriers **80 dB** above analyzer noise! Intermod products extended outside this range, and with the 'Entertainer' downconverter in circuit, there were 'image' carriers tuning through in the opposite direction, revealing a response in the 2 GHz band, despite the converter's input bandpass filter. Switching to demodulator revealed that most of the interfering signals were FM/FDM telephony and data channels, plus some TV. But wait — there's a TV signal with SECAM ident . . . and there's another! The 'ten green bottles' in the SECAM VBI were clearly visible, and we realized the antenna was indeed aligned directly onto the Soviet bird. There were



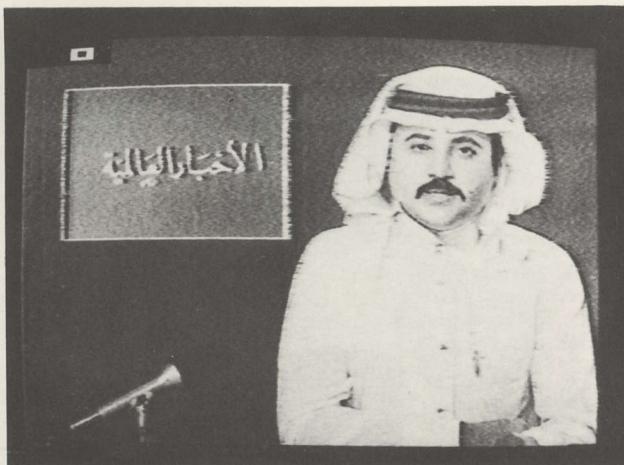
A FEW WEEKS WORK — and this US TVRO received was modified to full compatibility with the Moscow signals.

the familiar three channels battling through the terrestrial garbage, despite being 50 dB lower in level at this look angle. And the 'Moskva' spot-beam channel sat right in the center of the only clear spot on the dial, its slow dispersals revealing unmistakably its identity.

Clearly, any serious Intelsat work was out of the question here, even with a bank of notch filters. But out of curiosity, having confirmed that our marketable channel was interference-free, we set out to scan the rest of the sky. First, right back east to the Indian Ocean, and there were the dispersed telephony carriers in transponders 1 and 2 of Intelsat IVA F3 at  $60^{\circ}\text{E}$ , coming in low over London's financial and business center, the City. No TV though, as the three (TV) leases operate higher up the band, and were completely lost in the interference at this low elevation angle. Climbing up the eastern sky, the next bird was the Indian Ocean Gorizont-3 at  $53^{\circ}\text{E}$ , again with its 3675 TV channel, "Orbita-III Vostok" well clear, the others difficult. Raduga-9 at  $35^{\circ}\text{E}$ , suffered a similar fate, its 3875 TV "II Programa, Dubl-IV" resolvable close by the terrestrial at 3870, while its telephony at 3655 and below was in the clear. **The actuator arm was transferred to the opposite side of the frame**, and we now cranked westward from  $14^{\circ}\text{W}$ . At  $18^{\circ}\text{W}$  up came the big telephony carriers of Intelsat IVA F1, the Major Path 2 Atlantic bird. No TV on that one this afternoon. On



8 PM IN LONDON — and the Sonic Sound Sony tri-standard monitor shows off the newest 'live' TV channel; Moscow!



**SAUDI ARABIA** on a 3 meter terminal does not look quite as good as the Russians, but the 'enhanced half transponder' signal is plenty good for a ten foot dish!

westward to Intelsat IVA F2 at 21.5°W and there was the familiar Saudi Arabian announcer in his robe and head-dress, out in the clear on transponder 1E hemispheric, the JVC monitor just resolving the SECAM color from the narrow-band receiver. The team of helpers were quite bemused to see Arabic script on the screen. No luck, though, with the other three domestic leases on this bird, in amongst the terrestrials. 24.5°W, to the Atlantic Primary Intelsat V F3, and there on global beam transponder 12 was a transatlantic report on the situation in Argentina, **525 lines NTSC from CNN in the USA**, and more than a little noisy on the 3-meter terminal. We also saw a news report from Argentina, the title revealing the fact that the report was transmitted via Uruguay and uplinked from Brazil's Tangua earth

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station, for use by the BBC in England. Further westward to Major Path 1, Intelsat IVA F4 at 34.5°W, the home of the Spanish lease and much transatlantic TV traffic, although no TV was to be found at that time. At this point the Telecom Tower was just 90 degrees off to the side of our antenna and the rooftop was becoming quite cool and windy, so after an unsuccessful attempt to find TV signals on the 53°W American lease Intelsat (IV F3), it was decided to lock the antenna on to the Soviet satellite and adjourn to the shop premises below.

Having carried all our gear (including TV camera and U-Matic as well as triple-standard Betamax recorders) down a ladder, two flights of stairs and twelve floors of elevator to street level and round to the retail shop entrance, it was well into the evening and so we were spared the attentions of the general public. The two cable ends were dragged across the showroom floor, to the vicinity of a 27-inch 3-standard Sony monitor. BNC plugs were fitted, all was connected up and the 'Entertainer' switched on. A touch on the tuning knob and there, at 2200 Moscow time, up on the screen came Russia's coverage of the ice hockey championships from Finland, full color, crisp audio and no trace of sparklies or residual dispersal. The moment had come for congratulations all round. **The pictures were better than the store could receive from London's UHF broadcast transmitters at Crystal Palace, only seven miles away!**

The zone/hemi and hemi/global channels, sitting respectively directly between and hard up against the terrestrial carriers, required a further small modification to the HR-100 receiver. A switch was fitted to disable the AFC, which otherwise 'snatched' the receiver tuning away and locked on to the adjacent interference, some 50 dB higher in level. All worked satisfactorily, and we celebrated our achievement in bringing a high quality satellite TV demonstration to London, England.



**TRY THIS ONE!** With reconfiguration of Ghorizont at 14 west, this crude horn antenna pointed out a window at the Birkill TVRO Lab produces pictures when mated with a Birkill LNA and down converter. Ghorizont may have 42 dBW footprint into UK.

### THE GORIZONT SITUATION

The Soviet 14°W slot, Statsionar-4, saw some changes during early 1982. Ghorizont-4, in service here since early summer of 1980, appeared to be having problems with its 3675 MHz European spot beam transponder, the one serving the "Moskva" terminals of European Russia with Moscow's "I-Programma." EIRP towards England had declined by some 6 dB since fall 1981, giving real problems to the handful of under-engineered 2-meter terminals in western Europe. The Russians had also been seen experimenting with digital TV in transponder 11, 3925 MHz. When they announced the launch of a new Ghorizont, flight 5, on March 14, it was assumed this would be a replacement for Ghorizont-4. This assumption was reinforced when on March 26 it became apparent that the spot beam EIRP had increased by 6 to 8 dB since the previous day. Pictures could now be resolved with a 12-inch square pyramidal horn attached to the LNA, looking out of the window! But it was subsequently announced that Ghorizont-5 was on its way to 53°E to replace Ghorizont-3 at Statsionar-5, so we can only infer that a spare Ghorizont-4 was selected on March 26, accounting for its restored high EIRP, judged to be in the region of 42 dBW to the U.K.

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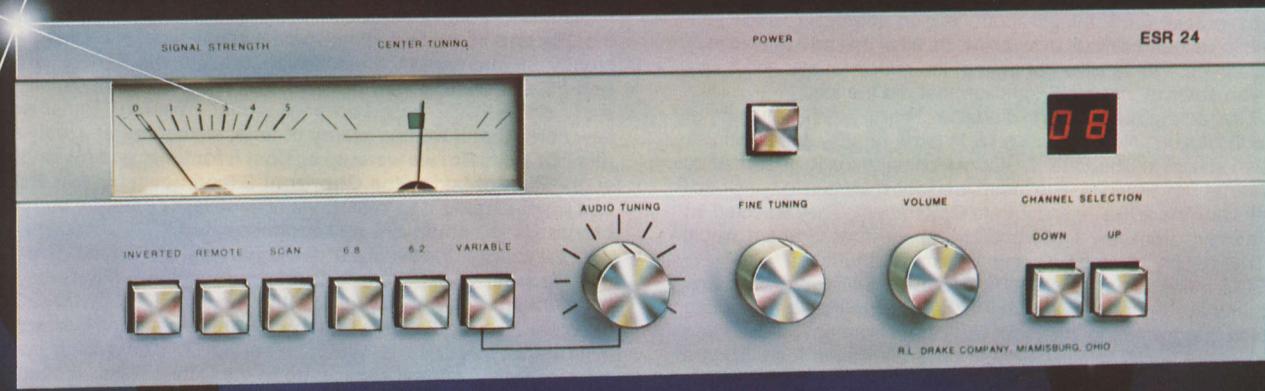
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## MOSCOW TO CHARLOTTE/DIRECT

### RUSSIA DIRECT

Each time we run any type of feature which reports on reception from any of the many-formatted Russian satellites, I can count on hearing from at least a couple of people who fail to see how Russian TV is of **any interest** at all in North America. I have felt for some years that sooner or later the Russian satellite system would play a major role in the development of television service in unserved regions of the world. I even felt that, sooner or later, we would see US broadcasting interests making some type of **direct** use of Russian satellite service.

Well, I am vindicated. And I love this story because it points up that you can never be sure where an innovative, new use, of satellites will spring up. It all happened this way, starting back in the first week in May. Dr. Billy Graham was in Russia, attending a conference which attracted lots of negative publicity from the US press. Dr. Graham's presence there also attracted negative publicity since he was reported to have said some things about religion in Russia which anti-Russian folks found difficult to swallow. Be all of that as it may or may not have been, the satellite got right in the middle of this and it was a Russian satellite, not a US satellite, that did the job.

Dr. Graham hails from North Carolina. There, he is something of a 'state institution'; North Carolina by in large proudly claims him. A television station in Charlotte, WSOC which happens to be owned by the powerful Cox Broadcasting group, decided it wanted to bring back to North Carolina a **live** telecast from Dr. Graham. They selected an early morning (Moscow time) church service that Graham would lead. That happened to be around 11 p.m. in Charlotte.

WSOC made inquiries of INTELSAT/COMSAT (you remember **them**; they are the people who have the '**exclusive right**' to bring television programming into the USA from foreign points), and gagged at the bucks Intelsat wanted for a 30 minute feed. Then a fellow who works for WSOC, and who reads **CSD**, decided to call (you guessed it!) Bob Behar at Hero Communications. In the back of the WSOC engineer's mind was the Behar work with Ghorizont.

Now for many months one of the major US networks has had a news crew camped out in the Hero showrooms each afternoon, videotaping off of Ghorizont the Moscow news and news feeds. Earlier this year, they used this Behar provided reception in their nightly evening newscasts, thereby getting some exclusive (in the USA) looks at Poland, via Ghorizont, and Moscow television. More recently, they have been there plugged into the newly activated Argentine national television service found on Intelsat. I don't need to tell you **why** they are doing this!

Behar's experience with Ghorizont, and WSOC's interest in getting a live Moscow-to-Charlotte feed became a partnership. First, a series of Telex messages was sent to every known Russian telecommunications contact. The Russian Embassy in Washington proved very helpful and soon WSOC's Dick Raley was communicating directly with Lev Korolev (Korolyov) of 'Soviet TV.' The Russians were intrigued. Nobody had ever come to them, previously, to ask to rent Ghorizont service to link the USA with anywhere else; least of all, Moscow. But the Russians were ready with established rates. Intersputnik rates for the feed were 40 gold Francs per minute

while the 10 kHz audio (sub-carrier) provided would cost WSOC 0.6 gold Francs per minute. After ten minutes time the rates dropped to 28.2 gold Francs per video minute. Payment was to be sent in advance, and if the Russian insistence on receiving payment in "French Gold" tells you anything about their view of the world's economy, so be it!

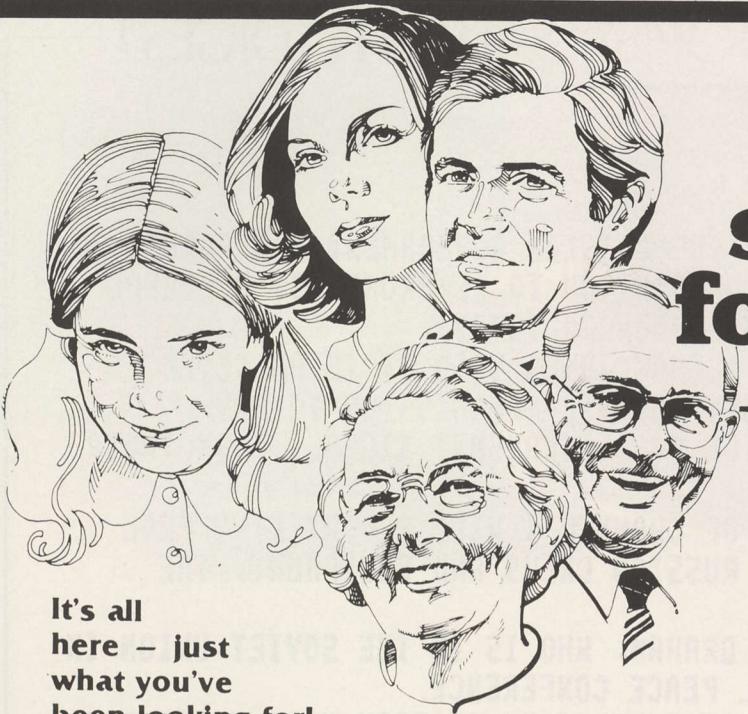
The Russian's Vice Director of the Communications Ministry ended up on the telephone with Hero's Bob Behar at one point. Behar was surprised to find out the man's name was Valdes; close to the Cuban Valdez. "**Are you certain our Ghorizont 2/Statsonar 4 signal will be available in North Carolina?**" he wondered. Behar assured him it was, and explained that a transportable 5 meter terminal would be set up for the feed. The (USA receiver) transponder 9 channel we are familiar with on this Russian bird is called 'Circuit 10' by the Russians. They arranged that the service would originate in a Moscow studio provided by Soviet TV in SECAM standard (cost to rent same, men and equipment, in Moscow was quoted as \$1224 US dollars **per day**), be terrestrial carried from Moscow to the Dubna uplink site in SECAM, where it would be standards-converted to NTSC 525 line (incidental costs included VTR rental at \$150 per hour US, Soviet Television Coordinator at \$50 US per day). The Dubna uplink site would feed Ghorizont 2 directly, and over in Charlotte, a transportable terminal would bring the signal down.

"**I would like to ask you to hold your bird flight pattern more closely**" Behar asked of Valdes. "**Lately, it has been drifting in a figure-8 pattern and our transportable terminal is a polar mounted antenna and cannot track north and south variations.**" Valdes admitted Ghorizont 2 had been wandering abit of late, and he promised to see that it was kept 'on station' during the feed.

Someplace along close to the actual event (which was actually to be a pair of feeds, May 8th and May 11th, from 10:45 ET to 11:15 ET) the American officials got involved. "**You can't do that!**" one told WSOC, and Behar. "**Why can't we?**" they wanted to know. "**Well . . . you just can't do it!**". It turned out that WSOC **could** do what they had planned to do, and no US rules or regulations would be broken as long as the Ghorizont 2 signal was not transported within the USA on a domestic common carrier of **any** type. The rules clearly prohibit an international transmission, brought into the states on a **non**-Intelsat carrier, from being then transported further into the states on an FCC licensed common carrier. "**We felt**" Behar would later note "**that if we had plenty of time, we could get a waiver of this FCC rule. But we were up against it for time, and my original suggestion of taking the Ghorizont 2 feed down here in Miami, and then relaying it to WSOC via terrestrial or satellite common carrier simply could not be accommodated.**"

If the shock of the event, i.e. dealing directly with Soviet TV for use of a Russian geo-stationary satellite, caught the US State Department and the FCC off-guard, the money saved by WSOC by using the Russian 'Intersputnik' system rather than Intelsat was an even greater surprise to WSOC. The station was adding up the columns for the Intelsat service; **up to** the Dubna Russian operated Intelsat uplink, the costs were pretty much the same as using Ghorizont direct; **except**, that the charges made to WSOC were being 'factored' by Intelsat, and were therefore going to be larger with Intelsat. The 'space segment' was several times as much for the service, which also included a two-way 'open telephone link' that allowed WSOC news people to ask interview questions of Dr. Graham during the feed. Behar estimated after the event the total cost to WSOC was under \$3,000 by using the Russians exclusively; but with the combination of the Russians and Intelsat, it came to perhaps \$8,000. Using the Russian satellite, then, was a not insignificant savings for the station.

On the evening of the first feed Behar and WSOC were nervous. The signal was good all along the eastern seaboard. Cuban television was on transponder 9 ('Circuit 10'). Then five minutes before the appointed feed time the Cuban transmission dropped and Moscow took over. The video being transmitted was in SECAM; somebody in Moscow was getting the feed to Dubna alright, but the Dubna technician was forgetting to switch in the standards converter for SECAM to NTSC conversion! WSOC and Behar both rushed to the telephone to attempt to get through to Moscow. But before either call would clear the USA, the Dubna technician pushed the right button



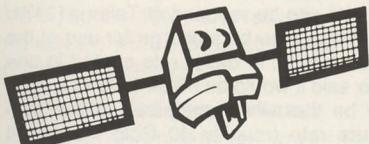
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**10:30 A.M.**  
 11:30M 12:30C 1:30E 2:30A

02 [F3] - Good News America  
 03 [F3] - INN News  
 07 [F4] - Transformed  
 07 [F3] - ESPN's SportsTalk  
 Special: 1982 NFL Draft  
 09 [W4] - Club de la Television  
 10 [W4] - Business Analysis  
 11 [AB] - Mr. Dressup  
 15 [F3] - News Update  
 15 [AB] - Femme D'Aujourd Hui  
 16 [F3] - Tomorrow's Families  
 17 [F3] - Pitfall  
 17 [F4] - Jimmy Swaggart  
 19 [AB] - Regional Program  
 19 [A2/3] - Just Like Mom  
 20 [F3] - MOVIE: 'The Late Show' A lady coaxes a crusty private eye out of retirement to find her cat and together they unravel blackmail, mystery and murder. Lily Tomlin, Art Carney, Bill Macy. 1977.  
 22 [W4] - Susan Noon Show  
 24 [F3] - MOVIE: 'The Big Red One' A combat veteran leads his battalion of young soldiers into toughening battle. Lee Marvin, Mark Hamill, Robert Carradine. 1980. Rated PG.  
 03 [F1] - CBS News  
 23 [F2] - NBC News (Dual A)  
 21 [W4] - Matinee at the Bijou "Cowboy Comodores"

**11:00 A.M.**  
 12:00M 1:00C 2:00E 3:00A

01 [A2/3] - Definition  
 02 [F3] - Good News  
 03 [F3] - Dick Van Dyke  
 06 [W4] - Caras y Gestos  
 07 [F4] - The King Is Coming  
 07 [A2/3] - One Life to Live  
 08 [F3] - It's a Great Idea  
 09 [F3] - Coronation Street  
 09 [W4] - Catedras Uni  
 versitarias  
 10 [W4] - Nyse, Amex Update  
 11 [AB] - Sesame Street  
 11 [F2] - Sky...Blue?  
 12 [F3] - MOVIE: 'I'll Cry Tomorrow' This autobiographical story of Lillian Roth chronicles her decline into alcoholism and her slow journey back to health. Susan Hayward, Richard Conte, Edie Albert. 1956.  
 15 [F3] - News Update  
 16 [F3] - Growing Years  
 17 [F3] - Bull's Eye  
 17 [F4] - Our Jewish Roots  
 19 [AB] - Wok with Yan  
 19 [A2/3] - Mighty Hercules  
 22 [F3] - Pertinent Magazine  
 22 [W4] - Sew Video  
 03 [F1] - CBS NBA Basketball  
 Playoff (2 1/2 hrs.)  
 17 [W4] - Big Blue Marble  
 21 [W4] - Market to Market  
 23 [F2] - Smurfs  
 15 [W4] - Last Chance Garage



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(CHARLOTTE, NORTH CAROLINA)-- THE RUSSIAN GOVERNMENT HAS AGREED TO ALLOW A CHARLOTTE-BASED TELEVISION STATION TO RE-BROADCAST A SIGNAL FROM A RUSSIAN SATELLITE, IT WAS ANNOUNCED TODAY.

W-5-O-C T-V GENERAL MANAGER FREEMAN JONES SAID IT IS BELIEVED TO BE THE FIRST TIME THE RUSSIANS HAVE GRANTED PERMISSION TO ANY AMERICAN BROADCASTING ORGANIZATION TO RE-TRANSMIT SIGNALS FROM THEIR INTER-SPUTNIK SATELLITE NETWORK.

DAVID HAINS AND BRUCE BOWERS OF CHANNEL 9 WILL REPORT LIVE FROM MOSCOW AT 11 P-M TONIGHT, USING RUSSIAN CREWS AND EQUIPMENT, THE STATION SAID.

THEY HOPE TO INTERVIEW BILLY GRAHAM, WHO IS IN THE SOVIET UNION IN CONNECTION WITH AN INTERNATIONAL PEACE CONFERENCE.

JONES SAID ENGINEERS AT THE U-S TELEVISION STATION HAVE ERECTED A SPECIAL MODIFIED EARTH STATION TO RECEIVE THE SATELLITE SIGNAL.

UPI 05-07-82 03:40 PED

and the video became NTSC 525 lines. The transmission went off without a hitch, and among those interested observers at Hero Communications in South Florida were news and engineering personnel from Miami's WTVJ. They liked what they saw, and in the days that followed they and Behar would begin the task of establishing a similar news feed for the same hour, 'live via satellite from Moscow,' for May 26.

## HOW TO USE GHORIZONT 2

1) Make your initial contact with Lev Korolyov at Soviet Television, Moscow; telex 411340 (Tele Su).

Ghorizont 2 rates fluctuate daily as monetary exchange rates fluctuate but the combination of a video feed and accompanying 10 kHz audio channel (sub-carrier) feed will be in the neighborhood of 40.6 Gold Francs per minute for the first ten minutes, and 28.86 Gold Francs per minute after 10 minutes.

2) Technical details of the feed and confirmation will come from R. Valdes, Vice Director of the Communications Ministry (telex 411288 Disk Su), or, from F. Bierbach (telex 411289 Disk Su).

3) Any communications directed to Korolyov should also be sent to the following agencies:

- A) Soviet Ministry of Communications, Moscow (Attention Novikov, or, Krovstovitsky; telex 411471);
- B) Intersputnik, Moscow (telex 411288 or 411289);
- C) Intervision Programme Coordinator, Prague, Czechoslovakia (telex 122444);
- D) Intervision Technical Coordination Center, Prague, Czechoslovakia (telex 121559);
- E) Soviet Television, Moscow (telex 411140 or 411340).

Depending upon the time of day when the desired feed takes place, it may be necessary for the Intervision (Intersputnik governing body) to approve the feed. If you use Ghorizont prior to the normal Intervision schedule, you will probably deal only with Moscow. If you use it while Intervision feeds are normally scheduled, you may be turned down, or, at best have to coax Intervision in Prague into

For those who might wish to take the WSOC/Behar connection into their own TV marketplaces, a 'box' appears here with the relevant facts and Telex/telephone contacts to put the circuit together. Keep in mind that the Ghorizont 2 service originates from 14 west, and as such it is only useful in the states that border the Atlantic, and perhaps a couple of hundred miles inland (further inland in the southern USA).

releasing their own time on the bird.

4) It is far simpler to rent use of (SECAM) equipment in Moscow, and use a Soviet crew, than to attempt to haul US NTSC gear to Russia to do the actual video coverage. These arrangements are made with Soviet Television, and as noted, come to \$1224 per day in US dollars at the present time.

Keep in mind that you are dealing with three separate Soviet TV elements:

First — the ground video crew, equipment and coverage;

Second — the terrestrial link (in SECAM video) from Moscow Television to the Dubna uplink site some 150 kilometers from Moscow, where it is processed with standards conversion equipment to NTSC 525 lines;

Third — the uplink system, plus the Russian bird itself. Just for the record, you can (or may) communicate directly with the Dubna uplink site via Telex at 411405. F. Bierbach is apparently a person of authority over the Dubna uplink site. It also appears from Telex records retained during the event that there is a coordinator or superior for the Dubna site who can be reached at Telex 411471. There may also be a charge for use of the Dubna facility; a 'daily' rate quoted in one Telex said it would be 83.34 Gold Francs. It may be that when compared to the per-minute rate (roughly 40 Gold Francs), it would not be worth the hassle to ask that this rate be reduced to an hourly rate.



# Videophile Satellite Television

The possibilities of component audio come to satellite video.

Component equipment has become popular in the audio field for a lot of reasons. One reason is that the component philosophy allows a purist to upgrade any piece of a system as technology advances without having to replace the entire system at once. This basic idea has ushered in an era of specialty firms dedicated to advancing the art of a single link in the chain. They succeed because all of their efforts are focused on one discipline, not thinly spread over an entire system. EARTH TERMINALS™ brings this philosophy to satellite television. We concentrate on the single most important, most difficult element—the microwave receiver. No other part of the system has such a dramatic effect on picture quality.

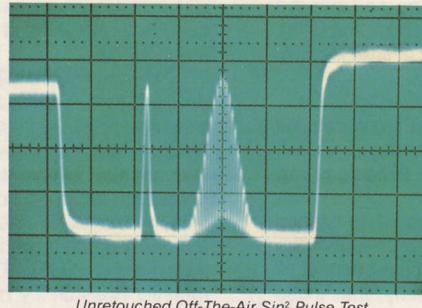
#### Quality You Can See

An EARTH TERMINALS receiver provides cleaner pictures with less granularity. Truer colors that don't smear. Less sparkling snow on weak programs. Complete absence of herringbones and waves. Superimposed lettering that doesn't tear at the edges. In fact, you haven't seen video this exciting unless you've been in a television studio. If you own a quality video projector, you'll be even more impressed.

#### Quality You Can Measure

Broadcast engineers are impressed with the accuracy of EARTH TERMINALS receivers too. Our VITS  $\text{Sin}^2$  Pulse and video SNR test results are incom-

parable; actually the equal of most commercial grade receivers. We can also handle tough signals like Reuters data transmissions that give other receivers fits. It's no wonder then, that after exhaustive testing, some cable companies and television stations use EARTH TERMINALS receivers as their main source of satellite program material. They know value when they see it.



#### It's Easy To Live With

All this technical sophistication is really quite easy to get along with. Precise automatic fine tuning tunes every channel the same way every time. You don't have to be an expert to get perfect

pictures. EARTH TERMINALS receivers come with a remote control that selects channels individually, adjusts audio volume at your convenience, and automatically signals the rest of your system to supply the proper antenna polarization through an even/odd channel switch. And it fits in the palm of your hand.

#### Tips On Value

There are plenty of satellite receivers that cost less than ours, but nearly all of them need bigger antennas and more exotic Low Noise Amplifiers for a picture free of sparkling snow. If you're on a budget, you can save money in other parts of the system by paying more for our receiver and come out even. You get high fidelity video in the bargain. If you're simply after the best picture money can buy, we can make it very affordable. Either way, give us a call or write us for the details.

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**EARTH TERMINALS**

5) If your telephone Russian is good, or you can stand the long wait while an English translator is found, you can call Valentine Yegorov or Vitaly Sufan at 215-76-34, or, 215-85-65 at Soviet TV to discuss the project you may have in mind. Lacking a Russian speaking ability, apparently there is at least a French language speaking person on duty daily. Re-

member that Moscow time is 8 hours 'ahead' of eastern USA time; Soviet TV's weekday office hours are 9 a.m. (1 a.m. USA) to 6 p.m. (10 a.m. USA). Some have had some luck in 'direct dialing' by dialing (or having the operator dial) 011-7-095, followed by the appropriate number previously given here.

## COOP ON BASICS

Everyone has to start off at the beginning; and for many of the recent entrants to the business of selling and installing and servicing TVRO systems, the beginning has often been without the basics. SPACE is addressing this issue by scheduling a special fourth (extra) advance day at their annual trade show this coming August in Omaha; the first day will allow the newcomers (i.e. Novices) to the field to get started by learning how the basic system works, and what you can (and cannot) do with it.

Recognizing that not everyone will attend the SPACE show (pity), CSD begins a multiple part series this month which will probably revolve around itself every six months or so and start all over again, fresh, to catch the next batch of new entrants into the field. This month we will look at the history of private terminals, and how the movement to have at-home private dishes got underway. If you are new to the field, and understand some of the growing pains in the industry to this point, you will be better able to understand some of the pressures that are being brought on this new industry to shut it down.

### NOT FOR YOU

When Arthur C. Clarke first envisioned the geostationary satellite system (see **CSD**, October 1979; available in **CSD Anthology, Volume One**), he thought of it as a broadcasting system. **Broadcasting** is a key word here, as we shall see.

Clarke, correctly, calculated that three satellites could be spaced around the globe, at an altitude of 22,300 miles directly above the equator, and between the three stations, they could cover almost all of the inhabited globe. Clarke foresaw, again correctly, that those areas close to the poles would not be able to view geostationary satellites because the bulge of the earth was so great that by the time you got near 75/80 degrees north (or south), you could no longer 'see' a satellite positioned a 'mere' 22,300 miles above the equator. Clarke pointed out, before there was anything like national television networks (he wrote about this in 1945), that with just three stations in space, tens of thousands of terrestrial stations could be replaced. Clarke foresaw that it would be far less expensive to design, construct and launch three space stations than it would be to construct thousands of local-service VHF and/or UHF terrestrial stations, and then build a terrestrial interconnection network so that they could all broadcast the same program at the same time; if even only on a 'national' basis.

The first geostationary satellite would come nearly twenty years after Clarke told everyone how to do it. It was used to provide a single

TV channel of relay service between continents, and a couple of hundred telephone type circuits. It established the groundwork for the system we have today.

It quickly became apparent that to build a world circling system of three satellites was going to take a bunch of bucks. It also became apparent that there were going to be fierce 'national interest' struggles to keep the system from developing into an international political football. Most of the nations of the world, who had an interest in improved telecommunications, did **not want** their citizens to have access to transmissions from space. The North American system of free-enterprise-broadcasting was sort of unique in the world. Most European countries, for example, and virtually all of the Communist block nations, had spent more than 60 years designing national radio (and then television) systems that are clearly intended to keep their citizens from listening to, or watching, broadcasts from **other** nations. England and Iceland had a relatively easy time of keeping their citizens from watching foreign television; television operated on VHF (and later UHF) channels, and the nature of such channels was that they didn't travel very far before the transmissions became weak and useless. If you are an island-nation, the water surrounding you was a sort of built-in buffer.

Other nations, such as France and Belgium, had a tougher time maintaining their national, government controlled hold on listening and viewing. With land locked borders on some or all sides, even the relatively short range VHF and UHF signals managed to cross over from adjacent countries. France took a second step to cut down on 'outside viewing'; it developed a television receiving system using 'standards' that were unique to France (and later its territories, since the mother country always attempts to export its technology). Since most French viewers could be expected to purchase receivers designed for reception of French TV signals, and since most such receivers did not (initially) receive anything but the 'French standard' signals, people were prevented from viewing German or Dutch television simply because their receivers would not 'demodulate' (as in decode to picture and sound) the transmissions from nearby countries.

**Belgium took a different approach.** It recognized that people in Belgium often were part French or part German or part something else, and that they wanted to have access to other nearby television. Belgium has always been something of a maverick in the European telecommunications world. So Belgium authorized local business people to construct something the Americans and Canadians had exploited; cable television. Today something approaching 75% of all Belgium homes have cable TV, and the Belgium cable viewers watch their own selection of TV from nations all around them, including most recently Russian TV delivered from a Russian (Horizont) satellite.

The Belgium **progress** is exactly what the nations of the world wished to avoid back in 1963-65 when they were busy analyzing the technical results of the first geostationary satellites, and trying to figure out how to have an international system that didn't step on any 'nationalistic' toes. So they did two things:

### 1) An International business corporation was established.

It was to be called Intelsat, and individual investors, or governments were asked to buy shares. In the United States, a second 'corporation' was formed, called COMSAT. And this second corporation went to the investor marketplace to raise funds. To insure that the 'investment' of each nation was 'secure' in this endeavor, a set of 'rules' were established. The rules would later become an important international treaty, agreed to and ratified by the various governments who initially, and subsequently, elected to participate in the ownership and

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operation of Intelsat. One of the rules was an agreement that Intelsat, and only Intelsat, would be authorized to provide international communications via satellite. In other words, if you had a message of any type to send from one country to another, and the satellite was the transmission medium, your message had to go via Intelsat. Nobody else was authorized to handle it.

This prevented any other international group, private or otherwise, from starting up a competitive satellite service. It would be very difficult to raise the funds to build an international Arthur C. Clarke type of system if your potential investors knew, going in, that you couldn't 'compete' in the marketplace for messages and revenue. Well, naturally the Communist Block decided that they would not honor 'that part' of the agreement, and they created their own Intersputnik system built around use of Russian Ghorizont satellites. Until very recently, the Russian Intersputnik system has had no real financial impact or operational impact on Intelsat; it was simply 'the system' in use by Soviet-aligned nations to transmit messages and communications traffic. Since Russia also made frequent use of Intelsat (to communicate with non-Soviet aligned nations), it gave enough business to the 'free world' side to keep everyone happy. That was before Billy Graham.

- 2) And then, having set into the framework a clever 'treaty' acknowledgement of Intelsat by each participating nation (more than 100 now are members), they then agreed in the same treaty that television programming would be designed to function in such a way that no use of one nation's television programs could be made by another nation.

This was backed up, separately, by something called the 'Brussels Copyright Convention' of 1975; a special copyright gathering of nations designed to set out the rules for use of satellite television programs.

Having the exclusive right to transmit internationally, and having each nation that signed the Intelsat agreement also agreeing to enforce all of the rules of the treaty and agreement internally, it looked like Intelsat had a hold, or lock, forever on international communications. And given this 'assurance' that they would always be the only or sole source for such transmissions, they proceeded to design a system.

One of the first problems encountered was a balance between the types of messages to be handled. If you are handling nothing but telephone (i.e. narrow band, voice) 'traffic,' you design the satellite system in one configuration. Or, if you are handling nothing but television (wideband, video), you design it in another way. When you have a mix between the two, somebody has to make an educated guess as to what percentage of the total volume of traffic will be one, and the other. This is an important decision since a satellite is designed to last up to ten years these days, and once the bird is designed, built and launched, it is not convenient to go to the bird and re-configure it for changes in traffic loading. Intelsat birds have always been very complex. Because they are international by design, they must have the ability to 'switch,' in space, their coverage patterns from world wide (called a 'Global' pattern) to smaller areas (called 'Hemispheric' and 'Spotbeam'). They must have this ability independently, on different transponders. They do this so that they can tailor-feed specific transmissions to specific areas. And all of this has to be decided more than ten years ahead of the satellite's last use; so Intelsat planners have to be very good advance-thinkers.

It turns out that they are good, but not perfect, in planning. So rather than get a full lifetime of use out of a satellite (i.e. while it still works on enough transponders to make it profitable to operate), they end up replacing whole generations of satellites with newer, more advanced (actually more in line with changing traffic pattern needs) birds every five years or so. They can afford to do this since they set the rates for use of their satellites based upon the amount of money they need to operate. Like the telephone company, they have a built-in "Guaranteed Rate Of Return." Within reason, they can spend whatever they want, because they can charge whatever they want. In a recent year the US arm of Intelsat, COMSAT, spent more than \$60,000,000 in research and development. A single year!

The key to a continuation of this "spend whatever you need to spend" philosophy has been that they have a 'protected turf.' A turf

guaranteed by each of the 100 nations that belong to Intelsat, and which have agreed to see that nobody within their own countries ever gets the opportunity to use a competitive satellite system for international communications.

With this background, it should not be surprising to learn that it is possible to get a very decent rate of return for a satellite system investment by charging less money for the satellite service than Intelsat charges. It is difficult to find numbers on the Russian Ghorizont system, for example, but when a television station in North Carolina can transmit a 'feed' from Moscow to Charlotte for about one third of the cost of using Intelsat, by using Ghorizont, one is at least suspicious.

Now in addition to the international need for satellite communications, it became apparent in the late 1960's that there were also domestic needs. Russia was the first to demonstrate this, and Canada was not far behind. In Canada, the need was for a communications system to reach the more northern portions of the country; with radio, telephone and television. The ANIK domestic satellite system was designed to fill that need. Over in the Pacific basin, Indonesia had a similar system designed; Palapa. Both countries found that they could amortize the cost of designing, building, launching and operating a domestic satellite system very nicely over a five to seven year period. Their option, at least on paper, was for them to lease transponder space on an Intelsat satellite for their message traffic. A few years after ANIK and Palapa were made operational, several African nations would do just that; join Intelsat, and then lease back from themselves and their fellow members fulltime use of one half or a whole satellite transponder. Through that transponder space they would uplink (send to the bird) television, radio and telephone traffic. Within their borders, they would then either buy and install, or lease (from Intelsat) and install their own receiving (downlink) stations. This was Intelsat's first taste of competition. Any nation could, following the Canadian lead, go into the satellite procurement and operations business. What Canada weighed was the cost of paying Intelsat money every month to use part of an Intelsat satellite, versus the cost of putting their own 'stripped down' satellite system into operation.

Now because the Canadian (and later) 'domestic' satellites would not be involved in complicated ten year advance planning, and because they would not be worrying about how many transponders to equip with 'switchable' Global, hemispheric or spotbeam transmission patterns (all of the transponders would have a single, 'spotbeam' pattern), there were a number of economies they could put into effect. Actually, the first ANIK could have been a stripped down version of an Intelsat. It was much more than that however; Hughes Aircraft designed a whole new family of 'domestic' satellites, and it opened up a few eyes in the satellite world.

The Canadian ANIK system brought to the foreground the first confrontation between two neighboring countries who wished to respect the Intelsat treaty accords, and who also wanted to protect their own turf. Canada knew that some of its 'spotbeam' signal(s) would make it into at least northern USA. The US figured this out too, and to insure that the Canadians did not try an end run around Intelsat and a then on-the-drawing-boards US domestic satellite system (Western Union, to be followed soon by RCA), the US told the Canadians that they would have to agree (a second time, above and beyond the Intelsat agreement) not to allow use of a Canadian satellite by any US user; except in a bona fide emergency involving 'restoration of service.' The Canadians agreed, reluctantly and at the last moment, because the US held a trump card; the Canadian satellite(s) would be launched by NASA, and it would not fly at all unless Canada agreed to this 'side letter.' This is the basis for the now infamous '1971 Letter Agreement' between the US and Canada. That 'agreement' is today the subject of a new round of negotiations going on between Canada and the USA, since 1971 was a long time ago, and now the 'rules have changed.'

Shortly after the first US satellite went up, a young, not established cable television firm called Home Box Office decided it wanted to expand its sports and movie evening service then available on cable systems in New Jersey, eastern Pennsylvania and downstate New York, via satellite. HBO worked out the finances with satellite operator RCA, and in September of 1975 the first HBO transmission

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went out via satellite.

Now in 1975, it took an eleven meter (nearly 40 foot) dish, a \$10,000 LNA and a \$12,000 TVRO receiver to get a clean picture from HBO. This, clearly, was not 'back-yard stuff.' But within a year, the cost of the receivers had come down to half, the cost of LNAs had come down to one third, and there were noises being made about using antennas smaller than 10 to 11 meters. In 1976, there was a demonstration, at a major US cable industry trade show, of reception using \$4,000 receivers, \$2,500 LNAs and 4.5 meter (15 foot) dishes. The pictures looked great!

In the intervening period, from HBO start-up to the 1976 demonstration, what had transpired was as follows:

- 1) The first LNAs sold had noise figures in the 300 degree range. With LNAs, noise figure is a qualitative measurement of how sensitive the low noise amplifier is. The lower the noise figure, the more sensitive the LNA. Within a year, LNA sensitivity got far better (down to 120 degrees) and surprise; the prices got lower!
- 2) The first TVRO receivers sold were straight off the shelf from Intelsat. They had gold plated everything, since Intelsat insisted on gold plated everything, and they were priced accordingly. In the intervening year, it was discovered that if you took off the gold plating (literally, connectors were gold plated!), and redesigned the receivers so that they were configured for the less complicated domestic satellite requirements, you could greatly reduce the prices. At the same time, rather than build 10 gold plated receivers per month, the producers were now building 100 or more 'chrome plated' receivers per month and manufacturing efficiency started to come into play.

With the reduced LNA noise figures, the improvement in receiver performance, it became apparent that smaller dish antennas would work just fine. Ultimately, as LNAs got **really** good, and receivers got **really** good, it would become apparent that a ten foot (3 meter) dish would work just fine for most applications where the signal was not going to be rebroadcast (via cable or through the air).

With everything getting better, cheaper, and coming down in size, the foundation for the private, home, earth terminals was laid. But first, there was a 'small' legal problem or two to face.

#### NOT FOR YOU/TWO

Way back in the 1960 era, when Intelsat was being created on paper, there was yet another agreement that wound up inside of the Intelsat agreement/treaties. That agreement was that "all satellite transmissions shall be considered, by international law, to be common carrier transmissions." You may be asking yourself what is a 'common carrier' transmission.

Well, in this big, wide world of communications there are two general families of transmissions. Those that are 'public,' and, those that are 'private.' Yes, it is true that many (not most, and certainly not all) nations of the world agree that the radio frequencies are 'owned' by the public. The US recognizes this point in law by assigning the Federal Communications Commission the task of 'administering the **public** airwaves for the greatest, possible, **public use and good.**' But public ownership is a broad concept, which does not extend to the actual administration of the whole spectrum. A 'private' transmission may well be 'common carrier,' and, a 'common carrier' transmission is always 'private.'

When grappling with how they should authorize US owned satellites to operate in space, it was determined, because of the Intelsat agreement/treaty which the US is a party to, that first of all the satellites would be considered 'common carrier' in nature. Then to re-enforce the 'common carrier' status of the satellites themselves, and their operators, the frequencies upon which satellites operate were earmarked as 'common carrier' in nature. That removed the satellites, and the frequencies which they would utilize, from the 'public' sector.

Another word for **public** transmission is 'broadcasting.' Broadcasting, as we know it in the USA, is largely commercially sponsored. It is a transmission intended for anyone who has a receiver capable of tuning in the broadcast, and there is no 'listening fee.' And while some nations charge an annual 'receiver use tax' to help defray the cost of **government owned** and operated national broadcasting sys-

tems, the US does not operate that way. Because the 'public owns' at least that portion of the spectrum which is designated public/broadcast, licenses are granted to **private** firms to operate radio or television transmitters on these frequencies. To insure that ALL of the public is served by such transmitters, it has been the recent practice to license such firms for a set period of time (three years), and when their license comes 'up' for renewal at the FCC, to go back and look at how well the licensee performed as a 'public trustee' of their frequency or channel in the past license period. If they got good marks, their license is renewed. If they do not, their license is given to somebody else. That's what happens on paper. In practice, licenses are not granted renewal only under the most terrible of circumstances.

'Common Carriers' are also licensed, but their criteria is far different. They have only one creed to dominate their operation. They must agree to accept the paid-for transmission from any party who asks them to 'transmit a message,' provided (1) the transmitting party has the money to pay for use of their facility, and, (2) they have time on their transmission system available. Most 'common carriers' also have the right to ask for a license for additional 'frequencies' if they can show that they are not able to accommodate all of the parties that want to use their transmission facility, because they are 'sold out' a high percentage of the time.

Because of the contractual arrangement between a 'common carrier' and the party bringing the transmission to them, the 'common carrier' is thought of as a 'message handler.' This means the common carrier has no 'ownership' or vested rights in the **material** being transmitted; the common carrier facility is considered 'opaque' to the content of the 'traffic.' A party using a common carrier can be another common carrier, or, it can be a private party. There is no regulation on this. However, during that period of time while the message is in the 'opaque' care of the common carrier, the message/traffic is considered to be 'protected' by the rules and regulations that were set in place to govern common carrier transmissions, way back in 1934 (i.e. the Communications Act of 1934).

**One of those rules** states that all common carrier transmissions are private in nature, and that the content of the message belongs to the sending party and then, secondarily, to the party(ies) to whom the message is directed. A telegram is a good analogy. You send it; it is yours, and it is private to you, and, to the party to whom you send it. If you send the same telegram to a hundred people, then you have 'addressed' the message to 'multiple recipients' although it has come from a single 'sender/originator.'

Into this 1934-ish rule comes the world of satellites; domestic satellites. HBO is not a common carrier, but they have a message to send to their affiliates. They go to RCA and they agree to rent the full time use of a transponder so that when they wish, as they wish, they can send a message to an affiliate. RCA provides the 'circuit,' part of which includes a satellite transmission 'leg.' HBO arranges to deliver the 'message' to the RCA uplink site at Vernon Valley, NJ and RCA then takes that private HBO message and sends it through an uplink transmitter (licensed by the FCC as a common carrier uplink transmitter), through space to F3R where it is received by and then retransmitted by an RCA Satcom satellite (also licensed by the FCC as a 'common carrier' transmitter). Now the 'message' is winging its way down from the RCA owned common carrier satellite. It is 'addressed' or directed to those affiliates with which HBO has privately agreed to 'communicate.' HBO is not a common carrier, and they are not treated as one by the rules and regulations. The message clearly belongs to HBO, and since they are transmitting it through a common carrier licensed system, the message is clearly not 'broadcasting' in the sense that it is 'public.' HBO, then, clearly has the right, under the 1934 law, to pick and choose whom they wish to send a message to. Their legal position is almost exactly the same as your legal position if you elect to send a telegram to 100 people. You select **which** 100 you want to get the message, and if somebody other than those 100 is irritated because they did not get on your 'telegram list,' they have no legal way to force you to add them to the list.

**Enter now the first private satellite terminals.** By 1977 or so there were a handful of such terminals about. Taylor Howard had one. Coop had another. Taylor Howard, not mindful of everything you have just read, had no license for his. Coop, aware of what you have

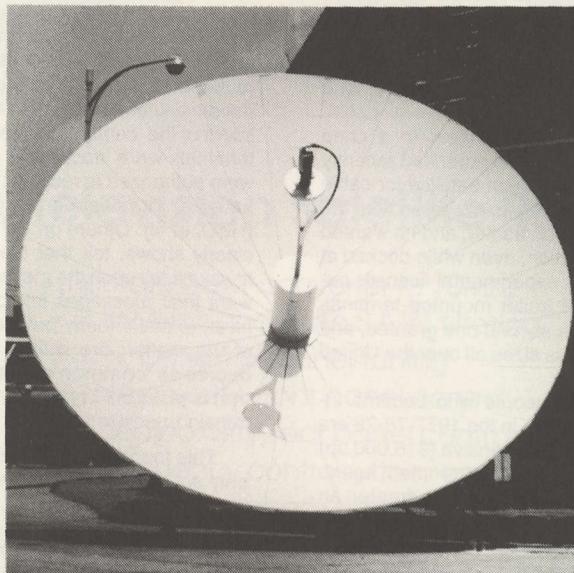
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just read, did obtain a license for his.

Only, there was no regulatory framework for Coop to get a license. Under the FCC rules, you could get a license to have a 'common carrier receiving terminal' if you were going to receive common carrier transmissions from a common carrier. You were, in effect, **part of the common carrier system**; the last 'link' between the HBO New York headquarters and the ultimate recipient of the HBO 'message.' Coop did not own and operate a cable system, so he did not qualify for a license. He found, however, that it was possible to apply for an 'experimental license' to create and test equipment associated with common carrier systems. Such licenses were granted for short periods of time (one year, typically), and for very specific purposes. You had to explain to the FCC exactly what you were working on (i.e. experimenting with), what you hoped to achieve with your experiments ("improve satellite receiving system hardware, and lower the cost of the equipment . . .") and where you intended to conduct the experiments and operate the 'licensed station.' Oh yes, you also had to submit, with your experimental license application, **written authorization** from those 'common carrier' services which you intended to 'intercept' during the course of your experiments. Coop obtained more than a dozen such letters from everyone from SHOWTIME to WTBS, in that era; HBO, true to form, was the lone hold out.

The first such 'experimental' license granted went to a chap named Ted Turner. Turner, a yachtsman of some note, had recently placed his channel 17 Atlanta television station on satellite for cable systems. It happened that Turner was going to be spending the summer defending a yachting title he had won earlier, and he wanted a way to keep an 'eye' on his television station, even while docked at a yacht harbor in New England. An FCC experimental license, authorizing him to haul around a 4.5 meter trailer mounted terminal, took care of that. Cooper's license was the second one granted, and it authorized him to haul antennas of various sizes all over the United States to conduct 'tests.'

Some (not many, but some) of those people who became intrigued with having their own satellite terminals in the 1977-78-79 era were concerned about investing money in an expensive (\$15,000 up) system which might be 'confiscated' by a zealous government agent. So they too sought licenses, like the Cooper license. This created an interesting bottleneck at the FCC; it quickly became apparent to the FCC that most of those requesting 'experimental' licenses were not in fact experimenting at all; that they were the front edge of a new wave of earth terminal owners.

Now in this period of time, the FCC required **ALL** TVRO terminal operators to have a license. Without one, you were illegal, and were subject to about the same jeopardy as a person caught driving a car without a driver's license. The police could, in theory, impound (as in confiscate) your vehicle, and the FCC could do the same with your earth terminal.

Unlike Coop who **was** able to get a long list of 'authorizations to view' from more than a dozen satellite program operators (HBO excepted), those that followed found the going far tougher. SHOWTIME was not about to authorize 50 people a month to 'experiment' with their signals. They, too, saw through the subterfuge. But, by this point in time there **WERE**, on satellite, some programming suppliers who **were not as selective** about granting permission. PTL and CBN were among those who early on decided that they would grant permission to **anyone** to receive their satellite delivered transmissions.

Now the FCC had a dilemma. They were being 'flooded' (any number more than one application a month was considered a flood!) with applications that met all of the requirements for experimental licensing. They only required one letter or approval of interception, and PTL and CBN were granting them. Following a guide Coop published, which duplicated his own experimental license application procedure, dozens of others were meeting all of the FCC rule requirements for experimental licenses. A few were granted, but most were simply put on hold. A timely renewal application from Coop, for another year of 'experiments,' was also put on 'hold.'

It happened at the same time the cable industry was balking at the tedious paperwork involved with licensing. The FCC, in a not typical move, was also unhappy with the growth of the cable license applications, since it meant a large increase in a specialized staff to process

the applications. The agency was under severe budget constraints, and they saw no **real** need for a continuation of the licensing process; especially when it meant more personnel that they did not have money to hire.

So a series of applications to change the rules, filed by people such as Coop, was acted upon and in October of 1979 the FCC decided that it was no longer necessary to get a license for a TVRO. Suddenly, Taylor Howard was legal! And so were hundreds of others who had never bothered with the Mickey Mouse experimental licensing route in the first place.

A videotape, obtained by Coop, of the October 1979 FCC meeting provided the text for a word by word record of the debate at the Commission which led up to the end of the licensing requirement (See **CSD** for December, 1979; available now in Volume One of the **CSD Anthology**). Many would later report that as a result of its October 1979 license requirement removal, the FCC had **sanc-tioned** private, at home TVRO terminals.

The truth is not quite so simple. As **CSD** for December of 1979 recounted, the FCC did indeed address in debate the fall-out of their action. **They did foresee** that without licensing, there would be a new growth of private terminals. Some on the FCC saw the licensing requirement as an inhibitor of private terminal growth. The same FCC people pointed out that private terminals were actually contrary to the intent of the 'common carrier' service, since the owners of the private terminals were 'accessing' not only those transmissions which they were authorized to receive (i.e. PTL, CBN), but also those which were refusing, for private and legal reasons, to authorize such reception (HBO, et al). Others on the Commission, as the 1979 debate record clearly shows, felt that the responsibility for protecting their transmissions fell upon the message sender; in other words, if HBO did not want their messages intercepted, they should do something (technical) to make them 'private.' The argument almost got to the heart of the matter; **are public frequencies, set aside by regulatory decree as 'common carrier,' private; or is it the message content that is private?** Three years later the same basic question would still remain unanswered.

This foundation, of confusion and unclear regulatory guides, not only set the stage for the explosion in home terminals that followed through 1980 and beyond, but it started a time fuse burning with the various program suppliers. Private terminals were, through 1980 and some of 1981, treated as electronic novelties. When Neiman Marcus advertised a \$36,000 (Scientific Atlanta) earth terminal in their Christmas 1980 catalog, they sold **one**. But the press they received, for including the 'gadget' in their catalog, was worth millions of dollars in (free) publicity. The \$36,000 price stuck in people's minds for more than a year, and with that high buck price tag in mind, the electronic, cable and broadcasting press largely ignored the sudden growth of private terminals at far lower prices; such as \$4,000.

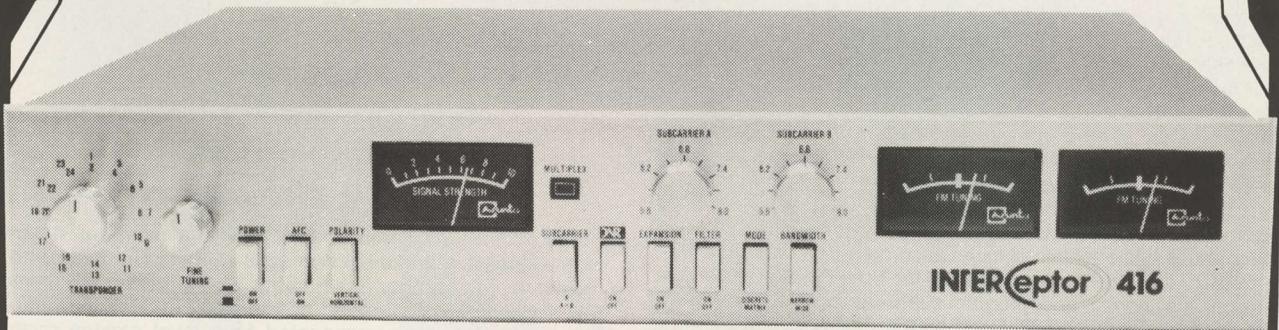
When, by the spring of 1981, it became apparent to the HBOs of the world that private terminals were no longer electronic novelties but perhaps a direct threat to their own 'private message circuit,' the young industry was starting to feel its oats. Meeting in Washington, DC for the first of three national meetings that year, the SPTS 'DC gathering featured newsmaker speakers such as FCC Commissioner Quello, Ralph Nader, and Congressmen. **When** one of those speakers (Congressman Rose) told the audience "**I believe that any transmission that comes down on my yard is mine to use and enjoy, privately,**" the hackles on the collective necks of HBO and cohorts rose several inches. The fat, clearly, was in the fire. But it was not yet burning.

As long as the users of this new technology were by in large rural folks who had no access to HBO locally (i.e. from a local cable firm), the dollars being 'lost' to HBO and cohorts was minimal; perhaps zero. But then when it became apparent, by the end of 1981, that some TVRO systems were going into hotels, motels, apartments and condominium complexes, and these locations were often where cable was serving or would soon serve, the fat began to burn. Now, without HBO authority and with no income passing to HBO, some body out there was taking the private HBO product and selling it. HBO considered the act theft. And they began to agitate for FCC and legislative relief to protect their message product from theft.

At the same time, the cable television industry (HBO is certainly

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a part of the cable industry, but it has a supplier stance there, not an operator stance) took a different view of these apartment/motel/hotel/condo TVRO systems. They saw them as competition, and furthermore they looked upon them as unfair competition.

The local cable firm was having to go through long, expensive 'negotiations' with their cities to win 'franchise approval' to serve the community. They were paying back to the franchising town or city a percentage of their gross (up to 5% typically), for the privilege of operating in that community. They were also forced, by federal and sometimes local, rules to carry dozens of signals which made them very little, if indeed any, money; as a part of their franchise.

The apartment/condo/hotel/motel system sellers were bringing in signals they usually did not contract for and pay for, were avoiding the expense and overhead of a local franchise (a franchise is not required unless the system operator crosses over a public street or thoroughfare), and were taking just the big revenue producer program services. Cable too, with its considerable political clout, went to work to get legislative relief.

And where there were legitimate licensing or service contracts between these apartment/hotel/motel/apartment operators (who by now were calling themselves **SMATV**, for Small Master Antenna Television — systems), and, program suppliers such as The Movie Channel, a new pressure developed on the program supply firms. Cable firms, trying to protect their own 'turf,' saw firms such as The Movie Channel playing both sides of the street.

**"If you continue to sell your service to SMATV people, we will simply stop buying from you"** cable firms told The Movie Channel.

Since the new, upstart SMATV firms were few, not organized, and they represented only a relative handful of new subscribers for The Movie Channel, while the cable firms were many, organized and they represented millions of new and existing subscribers, it didn't take very long for The Movie Channel (et al) to get the message. They simply stopped granting SMATV contracts, if they were granting them. And if they were like WTBS or HBO, they breathed a sigh of relief that they had never gotten started with SMATV in the first place.

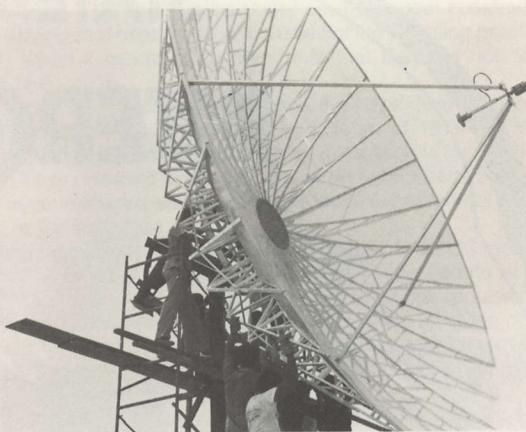
Taylor Howard, at an early SPTS seminar in 1979, remarked to the audience **"What we have here is a revolution. The technology to do something is created and functioning; but the legislation, and the business agreements, do not exist to support this new technology; nor can they accept it."**

Taylor, an engineer, was speaking with the wisdom of the college professor that he was, at the time (since retired from Stanford University). He would later in the same year say to another group **"Engineers do things because they are challenged as engineers to tackle and solve a problem. Engineers seldom consider the political or social implications of their work."** Clearly, in 1979, those who were a part of this fledgling industry were largely of the engineer mentality. It would be nearly two years before the engineering mentality addressed by Howard would be replaced within the industry by a social/political mentality. The transition, as reported in the first two years of **CSD**, would not always be smooth.

#### INTERNATIONAL DIMENSION

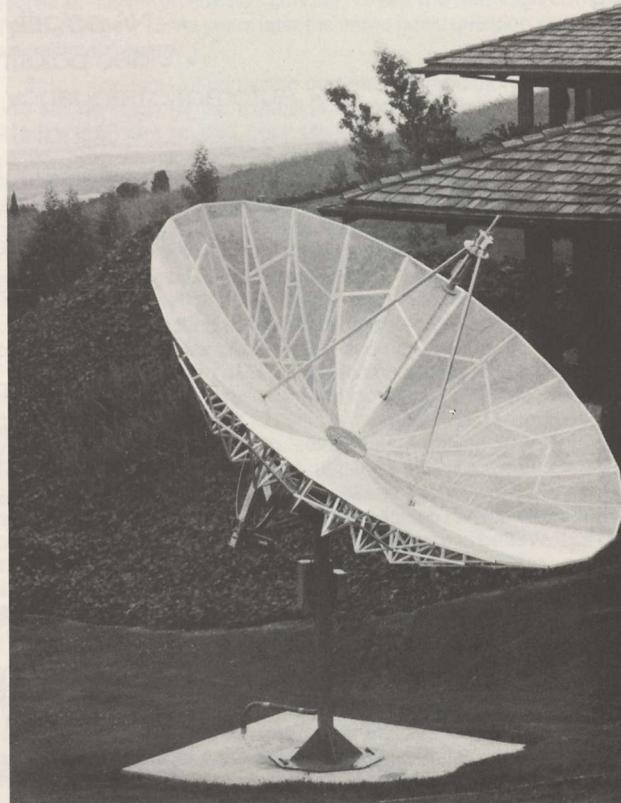
Through this growth and development, the problems created by private, unlicensed, TVRO terminals were largely confined to Canada and the United States. During this period Canada oscillated between a 'get tough' and confiscate policy, and, a 'if they are serving only a private home, leave them alone' policy. The Canadian experience was slightly different than the US experience because the Canadians largely wanted to watch **US television** from US domestic satellites. On the surface, this wounded Canadian authorities twice. First, because they were fiercely nationalistic about Canadians watching and liking Canadian television, and second, because they were trying to enforce the 1971 letter agreement with the United States.

Outside of the US, and Canada, there were very few private terminals operating. The reason for this was multi-fold. Primary was the lack of domestic satellites; those that had strong enough signals to make the use of relatively small home terminal antennas and systems practical. Only Indonesia had a similar system, and that brought in the second element; programming selection and content. Until quite recently, the Indonesian Palapa bird(s) have been largely used for a rather poor selection of Indonesian national television. Surrounding Indonesia, within 'range' and view of Palapa, were very



**NEW SIX METER** antenna installation in northern Colombia receives more than 20 US domestic satellite channels with no-sparkles, and another like number with substandard (commercial) service. A combination of improved receive terminal performance, plus, new unexpected high level service contours from RCA F3R and Westar 4 has come together to make this possible.

few countries and even fewer with residents so hard up for television that they would invest in a terminal to watch Indonesian internal political propaganda. Indonesia, you see, subscribed to the theory



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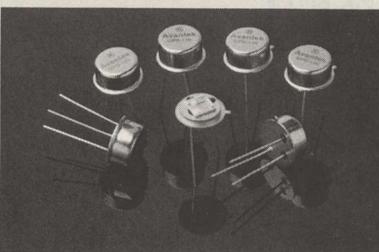
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-130	-130	0.1—400	12	7.0	+17
-310	-310	0.1—1000	7	6.0	-2
NONE	-311	0.1—1000	12	5.5	-2
-320	-320	0.1—1000	7	6.5	+8
NONE	-321	0.1—1000	12	6.0	+8
-330	-330	0.1—1000	6	7.0	+16
NONE	-331	0.1—1000	10	7.0	+16
NONE	-410	0.1—1300	10	6.0	-2
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that you use national broadcasting systems to keep the people informed of what you **want them** to know; and nothing else.

The only real demand for private terminals outside of the US and Canada was in those areas immediately adjacent to the two countries; largely to the south and southeast. But there, because the US and Canadian satellites had weak coverage patterns (by design) in this region, even 20 foot terminals were proving inadequate with normal 'stateside' electronics. The relative handful of terminals in private hands in the region were either owned by political dignitaries with unlimited bucks to spend (Fidel Castro, for example), or, by South American versions of Taylor Howard; engineers with no concept of what they might by uncorking from inside of the satellite Genie bottle.

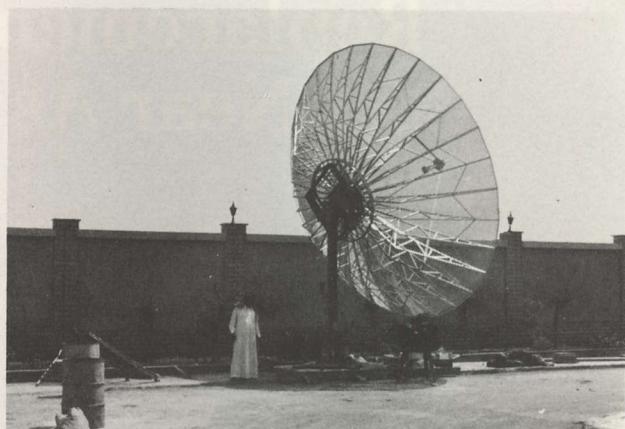
**All of that was BBB;** before Bob Behar. Florida supplier Bob Behar found himself in the manufacture and production and installation of private terminal systems after attending a 1978 cable TV conference, where he saw dishes as small as ten feet perform. His own back yard was probably among the first 25 in the United States to sport a dish. By being located in Florida and by having a good, working knowledge of the Caribbean and South American market, Behar became the leading agitator for the development of super-sensitive systems for offshore installations. Behar also was the first in the United States to install a system that provided fulltime reception from European and South American directed satellites. To be sure, his reception was not very good by US domestic satellite standards but it was good enough to push him into the national newspapers and onto national television when events such as the Moscow Olympics and Poland upheaval broke into the headlines. And he alone in North America, had an 'inside view' of what was happening via Russian and other far-distant satellites. It took Behar two solid years of work, and hundreds of thousands of dollars in his own R and D money, but he finally got a handle on the electronics required to make weak, Intelsat type signals 'play' with good quality on dishes in the 15 to 20 foot region. The importance of this breakthrough is yet to be fully understood, or measured. But many believe it will be as important as the breakthrough to ten foot dishes for the US and Canadian domestic market.

What this has done, it appears, is to put systems in the under \$15,000 (hardware cost) region into the marketplace where they can compete directly with the \$250,000 and up Intelsat grade terminals which favored Intelsat suppliers have been foisting off on unsuspecting member nations for years. And if the price differential is not enough to cause an international upheaval, the political ramifications will possibly be.

Remember from the early part of this series segment that in addition to the Intelsat 'accord' or agreement subscribed to by all member nations, that we also have a special 'Satellite Copyright Convention' (Brussels; 1975). This agreement, for reasons not clear even when one carefully reads all of the lengthy debate transcripts, **specifically exempts** from punishment and illegality, any 'private' (as in home) TVRO terminals which tune-in satellite transmissions from countries other than the country where the terminal is located. The same agreement also exempts several other 'classes' of international reception from copyright liability (see April 1981 **CSD**; available now in **CSD Anthology, Volume Two**). But it also prohibits, as a violation of the accord, those systems which receive such satellite transmissions internationally and then 'share' or 'rebroadcast' those programs either via cable or via (re)broadcast television. Most recently, the US has adopted new FCC regulations which establish a regulatory framework so that such international reception of **US domestic satellites** is now legally permissible; **provided** that the receiving system in the foreign nation has worked out a licensing agreement with the program ('private owner') operator in the USA. But this FCC ruling of late 1981 does not impact on the reception, for example, of a Nigerian transmission in South Africa; and the 'sharing' of that transmission with a whole South African community. -

However, unlike the Intelsat agreement which extends to all Intelsat members, the 1975 Brussels accord has had less than unanimous support. Fewer than 50 nations worldwide have ratified the treaty, and many of those have penned 'exceptions' or 'reservations' to their generalized support of the agreement.

This fact, plus the plain fact that 'money talks,' has led to the



**SAUDI ARABIA** terminal recently installed by Hero Communications brings more than a dozen high quality channels of service from three continents into the MATV system installed by the Sheik that footed the bill on this installation.

installation of several dozen cable and broadcasting systems; especially in Central America. Some now 'boast' (or admit to) tens of thousands of subscribers who routinely tune in HBO et al, delivered to their country via satellite, and then shared with the individual home viewers, for a fee. **None of that fee goes to HBO, et al.**

Until the Bob Behar work of the past six months, and his sudden although painful success in breaking through the technological barriers for relatively small terminals, the investment required to get a system off the ground in Costa Rica, for example, has been substantial. One Costa Rican cable firm spent nearly \$250,000 for an elaborate spherical satellite antenna to bring in a handful of US program channels; a feat that can be done today, using the Behar technology, for less than 1/10th the price and with twice as many channels spilling out of the dish for local distribution.

**This new technology** cuts across two prior barriers. **Number one**, it extends the 'reach' of US (and Canadian) domestic satellites into nearby regions where there is a demand for US television. And often, at least in the upper social strata, the dollars to pay for the service. **And number two**, and perhaps of far greater importance, where US domestic satellites are not generally receivable (such as Africa and deep in South America, and out into the Pacific), it makes very good quality reception from the far lower power Intelsat transponders usable for the first time, with fractional-cost terminals. If HBO and Showtime and The Movie Channel were nervous with seeing their product going into a few thousand apartments and other SMATV outlets in **the states**, how then will they feel when they see the same programs being distributed in the streets of Bogota, Caracas and Pago Pago?

Clearly, again, there are pseudo legal solutions to all of these problems brought on by 'engineers.' Equally clearly, there is no single fix that suits all of the individual legal problems except perhaps the development and deployment of an 'engineer-proof' scrambling system. As you can see, the rapid advance of technology has pushed the 'private program suppliers' to the very edge of what they can tolerate, and even if there were a law adopted tomorrow which would make unauthorized viewing of **US** domestic services punishable within the USA, that law would have no impact on what is rapidly developing into a much more 'severe problem' for the US 'private' programmers; the offshore reception and reuse of their products.

#### THE EXPLOSION IN PROGRAMMING

If all of this had happened in 1975, or 1976 or even 1977, and the then small number of program sources available were to have universally adopted an 'engineer proof' scrambling system, the private terminal development would have stalled and stopped overnight. But all of that has changed today because there are so many program sources available. No question, only a relatively small number are even remotely interested in scrambling their services.

The loss, then, of HBO and Showtime and even The Movie Chan-



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nel would have very little impact on the desirability of new, additional private terminals. **Even assuming** that once scrambled, such services were **forever lost** to private terminal viewing.

Even far removed from the US program reception area, the explosion in programming is continuing unfettered. A quality private terminal virtually anywhere in Africa can, today, have reception from a dozen channels or more. Ditto in the middle east. And even the Pacific basin, where satellite services have been slow to develop, is seeing a minor league explosion of new services with the development of both new Intelsat relayed services (CNN, for example, 17 hours per day to Japan and a lesser number of hours per day to Australia, starting January 1) and new domestic services coming on line fast. And because these involve Intelsat 'common carrier' services, the ball is now bouncing squarely at a confrontation with the world wide carrier.

Intelsat, like the US domestic carriers, has no control over the program content. They are simply a carrier for hire. **But**, they have a secondary interest in who receives their signals. Intelsat has always maintained, as the Canadian Telesat domestic carrier has also attempted to maintain, that they **must control** both the uplink plus the bird, and, the downlink terminal. They don't have to **OWN** the downlink, and lease it to you; but they do insist on providing it, to their specifications, through an 'approved' contractor. They claim that is

necessary to insure that every part of the service they provide, down to the final destination point, is maintained to their (gold plated) standards. A few, like Brazil which leases half transponder video space on an Intelsat bird for their Globo television network, have worked around this by acting as a middleman in the procurement of terminals. Most simply cave in to Intelsat pressure, and gleefully spend their \$250,000 to \$2,500,000 (and up) per receive terminal. Intelsat, whether they have some 'cozy arrangement' with downlink terminal suppliers (in return for 'approving' the terminals, or not), clearly does not want somebody bouncing into what they consider their (worldwide) backyard, with terminals that cost under 1/10th the going rate. They are already making loud noises about 'maintaining reception standards' and having 'adequate margins of service' to insure operation 99.96% of the year. Getting them to back down on these requirements will not come easily nor overnight. At stake is losing control of another part of their 'empire.'

#### NEXT MONTH

Having examined some of the important historical considerations that have occurred since the first private terminals appeared in North America, next month we will look at the history of the development of the LNA and antenna segment of the system; and explain how the performance of each, and the pricing changes in each, have played an important part in getting us to where we find ourselves today.

## INDUSTRY AT LARGE

## CORRESPONDENCE, NOTES, REBUTTALS AND CHARGES . . .

CSD provides this industry Forum with the understanding that opinions, thoughts and "facts" published are from the writers; no liability for statements extends to the publishers. Address letters to CSD / Industry, P. O. Box 100858, Ft. Lauderdale, FL 33310.

### ANTENNA SHOOT OUT

As you may be aware, our SelectView antenna has tested very well in the two antenna 'Shoot-Off' comparisons, held in Omaha this past summer and Fort Worth this past March. We have managed to live with the spirit of the rules insofar as it regards mentioning these results in advertising, but we have occasionally talked about the results! For our own purposes, we think it is time to come out of the closet, so to speak. We have tentatively arranged for Jack Trollman to pay us a visit with his test equipment. This will be something more than a simple rehash of the Omaha and Fort Worth testing as we intend to compare the performance of a substantial number of antennas.

We find ourselves in the same situation as several other suppliers in that we feel we have a very high quality product, and to be competitive we need to reduce the inputs required to build it. We are exploring several unique construction methods aimed at reducing costs, without any sacrifice in performance and strength. During this session, we will probably test ten different antennas of various configurations to reach an optimum system solution. It has occurred to me that an exercise of this sort might be an interesting procedure to portray to the industry, and we would be happy to share the process with CSD readers.

J.T.Daugherty  
President  
Valley Products Corp.  
Valley, Nebraska 68064

Getting the mystery out of in-field antenna evaluation is certainly a worthwhile subject matter for CSD. If Jack Trollman (half of the Trollman/Gustafson team that conducted the two antenna shoot outs so far) would like to prepare a report on the methods employed to evaluate a variety of construction designs, as you indicate, we would be pleased to print it. As readers are aware,

the two antenna comparison tests conducted to date have brought a wide range of test results indicating that there is a wide range of antenna performance out there in the marketplace. There has been some grumbling from those who don't like the testing procedure and the suggestion has been made that the test results are meaningless since they do not 'grade' the participants in numerical order in a public forum. The original intent of the tests, the present intent of the tests, is to give the antenna manufacturers the opportunity to find out, confidentially, just how their product stacks up against antennas of the same size. It was never intended to be a 'Consumer Report' system for antennas, since if you did it this way those who are trying for good performance, but who have not made the grade yet, would simply not participate. The testing program is designed to help manufacturers produce a better product; if it succeeds at that, then shortly the dealers will have better product to sell.

There are certainly other techniques for testing antennas. The Electronic Industry Association adopted a standard back in the early 70's. It is known as EIA RS-411. It starts off by telling you how to mount your antenna on a 'microwave clean RF test range.' Then it proceeds to tell you how to take approximately \$800,000 in 1982 value test equipment and make your tests. This is a fine procedure for S/A or a small handful of other firms that have the bucks to install such a test range. It is out of the question for a small firm building 10 or 100 antennas per month.

If you are a microwave engineer, graduated from Stanford or MIT, and you have \$800,000 or so to throw around for the equipment, plus perhaps another \$75,000 to build the 'microwave clean RF test range,' you can follow the EIA's 1973 standards. Lacking that, you have two choices; rent 'time' on such a test range (a few

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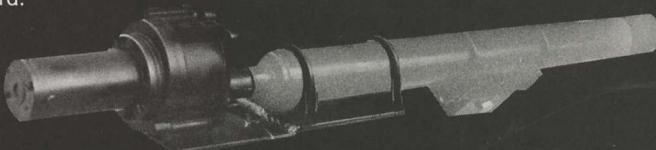


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FREEDOM to rotate your dish from the inside. FREEDOM from guessing that you are fine-tuned with the hand crank...FREEDOM to select over 45 pre-programmed stop locations by simply recalling the memory data by command through the keyboard.



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**KIMBERLING CITY, MO.**

**65686**

**417-739-4264**

have done this), or, develop an alternate technique. The Gustafson/Trollman technique is valid, it produces repeatable results, and is constantly being refined. It requires about \$6,000 in test equipment and it provides a 'calibrated reference system' that you can return to time and time again to determine if you are making a particular antenna better, or worse, as you move things around. There is always room for meaningful arguments between knowledgeable engineers. That's where progress comes from. But much of the criticism we are now hearing is motivated by bruised egos and is coming from people who can't even put our a decent signal on 14 MHz!

#### PROOF OF THE PUDDING

Over the last couple of years we have seen Coop and his friends extend a helping hand to people in the TVRO business in many ways. Last year in Omaha was no exception. As you may recall, we introduced a prototype of our new Paracclipse antenna there, and we asked that it be evaluated at the antenna shoot-out. As a result of this test, performed by Jack Trollman, Mike Gustafson and Taylor Howard, we found a problem with our antenna. It turned out to be the mesh size, and it was easy to correct. The help you folks provided was invaluable to me, and we would like to express our thanks to everyone involved!

David P. Johnson  
William C. Marsh  
Paradigm Mfg., Inc.  
2962 Cascade Blvd.  
Redding, Ca. 96003

Which is, of course, precisely why the antenna tests are offered at shows! Nobody is going to knowingly keep on producing an antenna that works poorly, but it is not always easy to determine why it does not work properly, or how poorly it is working. In effect, Trollman, Gustafson and Howard end up being unpaid consultants to the entire industry's antenna manufacturers in these tests. They determine how well you are doing, and then work with you to help you make it work better. That's a pretty decent spirit to have in the industry and it is about as unbiased as one can get.

#### LOW POWER TV MAGAZINE?

One June 4, 1981, in response to an advertisement appearing in the May 1981 CSD, I mailed a letter requesting a subscription and a copy of Low Power TV Book to a firm of the same name in Scottsdale, Arizona. The book and packet arrived but the magazine never materialized. I rewrote to the firm in November of 1981 and asked them to check on this for me. I have not received a reply to that letter. Could you please advise me if the firm is still in business, and what action might clear up the mix-up.

Paul W. Campbell  
RR #2, Cookstown  
Ontario, Canada  
LOL 1LO

We suspect a subscription foul up someplace. Low Power TV continues to advertise in CSD and your letter is the first we have received complaining about their product or service. We have

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never seen a copy of their magazine although they were kind enough to forward an early copy of their handbook. If anyone else has experienced any problems, please drop us a line.

#### STT T SHIRTS?

Does anyone still have Satellite Television Technology 'T Shirts' available? I would like to purchase a dozen as soon as possible, in assorted colors and sizes.

Rob Horwich  
High Overhead Video  
Berkeley, Ca. 94705

Back at the very first (or second . . . cannot remember which!) SPTS, we produced some STT T shirts. Basic white with three colors showing the satellite, and the STT identification. Coop checked with Susan and she has about a dozen mediums left, but they are down here in the Turks and Caicos. We had many more than that when we got here; now half the country wears them! Rick Schneringer at STTI (P.O. Box G, Arcadia, Ok. 73007) may have a line on a later 'vintage' STT T shirt; drop him a line.

#### MORE ON SCRAMBLING

As a (new) dealer in TVRO systems, I feel it might be a problem selling systems if HBO and SHOWTIME scramble their signals. Has CSD published any information on scrambling decoders? I have been told that when they do scramble, it will be a very difficult thing to 'break.' Do we even know when this scrambling will begin?

Zan Key

HBO and SHOWTIME HOPE it will be more difficult for you to sell terminals IF they scramble. That's the primary reason why they are placing news stories in the general press these days; to scare you, and your customers. We especially liked the dialogue used by Rick Brown during the recent (mid-May) National Microtech 'satellite seminar.' If you or anyone else needs a good discussion, on videotape, of the scrambling question, contact Horton Townes at National Microtech asking for a tape dub of the first satellite seminar day, with Rick Brown of SPACE on the seminar.

#### ONE FEED/MULTIPLE SPHERICALS

By adding a rotor under the LNA, and adjusting a second spherical dish to the feedhorn previously placed for the first spherical, you can receive multiple satellites with full arc coverage using a single LNA plus feed. I believe a person could easily install up to four sphericals to be used with a single LNA, mounted in this fashion.

Frank Weeks  
Design Homes, Inc.  
Prairie du Chien, Wi. 53821

You could circle the LNAs like wagons protecting the settlers against an Indian attack. Then if geostationary satellites are ever launched over the north pole, you'll be ready!

#### NOW I CAN SPELL IT

I talked on the telephone with the gentleman who owns **Satellite TV Week** and he suggested I contact you to learn about the ins and outs of satellites. I have a lot of questions regarding satellites. I am going to start selling satellites in Lake Havasu City (Az). I want to sell to private residents and hotels and bars. I was told there are no problems involved with selling to private residents; but that I need a disclaimer form when selling to bars and hotels. Could you explain what a disclaimer is? Also I was told that with hotels and bars I should provide them with a list of channels on the satellites, and then tell them to write to the programming firms on that list for their permission. Who are the programmers? How can I get their addresses? Can you also tell me what the newest laws are for private viewing and for hotels and bars? I know very little about satellites with regards to selling them. I would be very grateful for any help.

Gary Rogers  
P.O. Box 1169  
Lake Havasu City, Az. 86403

#### And Another.

I have been subscribing to **CSD** for three months. As a layman with virtually no knowledge of electronics, but simply interested in the

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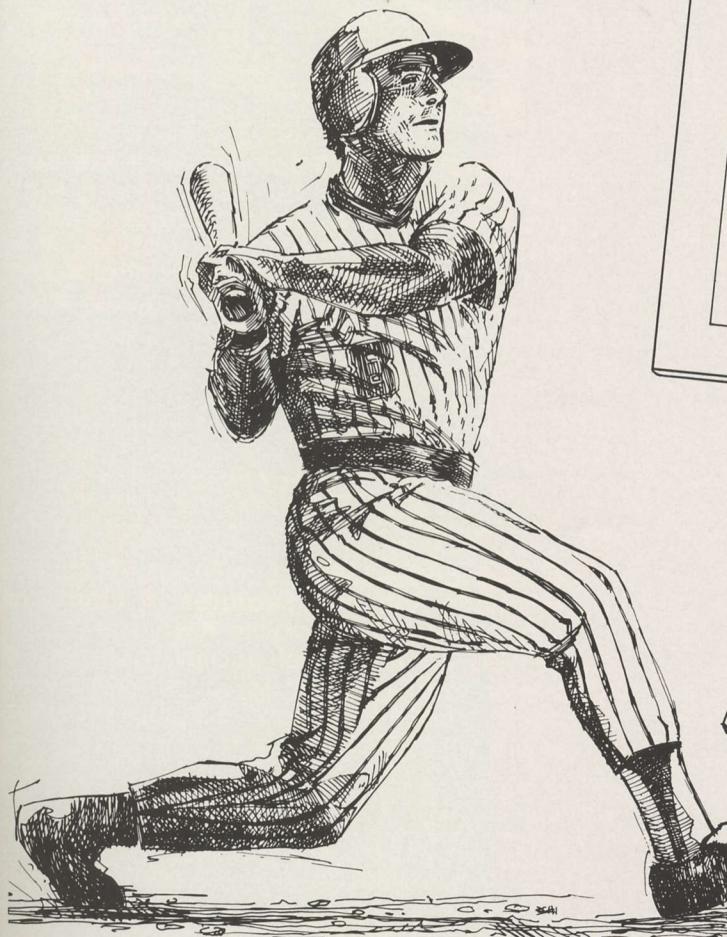
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MAY/JUN 1982

Vol. 2, No. 3

Issued 5-1-82

TR—	CHANNEL	PROGRAM	TRANSMITTER	Polarization	ODD Vertical
TR—1	1	NICKELODEON—premium children's programming [6 8]	WGN-TV (Chicago)	EVEN—Horizontal	
TR—2	2	ARTS [Alpha Repertory Television Service]—performing and cultural arts programming [6 8]	WGN-TV (Chicago)		
TR—3	3	PTL (People That Love) —religious [6 8]	WGN-TV (Chicago)		
TR—4	4	SPOTLIGHT—first-run movies, concert & entertainment specials [5 8 & 6 2 stereo/6 8 mono]	WGN-TV (Chicago)		
TR—5	5	THE MOVIE CHANNEL—24 hr/day first-run movies [5 8 & 6 8 stereo]	WGN-TV (Chicago)		
TR—6	6	WTBS, Atlanta—Ted Turner's Superstation [6 8]	WTBS (Atlanta)		
TR—7	7	ESPN [Entertainment & Sports Network]—24 hr/day sports [6 8]	ESPN (Entertainment & Sports Network)		
TR—8	8	CBN [Christian Broadcasting Network]—religious [6 8]	CBN (Christian Broadcasting Network)		
TR—9	9	USA NETWORK—professional sporting events, Cakope, and the English Channel [6 8]	USA NETWORK (West)	ODD Vertical	EVEN—Horizontal
TR—10	10	BET [Black Entertainment Network] [6 8]	BET (Black Entertainment Network)		
TR—11	11	SHOWTIME [West]—first-run movies, entertainment specials [6 8]	SHOWTIME (West)		
TR—12	12	MTV [Music Television]—Pop Rock Video [5 8 & 6 6 stereo]	MTV (Music Television)		
TR—13	13	SHOWTIME [East]—first-run movies, entertainment specials [6 8]	SHOWTIME (East)		
TR—14	14	HBO [Home Box Office] (West)—first-run movies, sports & entertainment specials [6 8]	HBO (Home Box Office) (West)		
TR—15	15	CNN II [Cable News Network second service]—CNN headline news [6 8]	CNN II (Cable News Network)		
TR—16	16	CNN II [Cable News Network second service]—CNN headline news [6 8]	CNN II (Cable News Network)		
TR—17	17	SHOWTIME [Spain]—pron channel & regional remote & sporting events feeds [6 8]	SHOWTIME (Spain)		
TR—18	18	HTN PLUS [Home Theatre Network]—first-run G and PG movies [6 2/6 8]	HTN PLUS (Home Theatre Network)		
TR—19	19	AETN [American Educational Television Network]—religious [6 8]	AETN (American Educational Television Network)		
TR—20	20	NJTV [National Jewish Television]—religious [6 8]	NJTV (National Jewish Television)		
TR—21	21	WOR-TV, New York—the Big Apple's top independent station [6 8] Transfers to W4/TR—50(June 30, 1982)	WOR-TV (New York)		
TR—22	22	REUTER'S MONITOR SERVICE—commodity/stock market information [digital video]	REUTER'S MONITOR SERVICE		
TR—23	23	C-SPAN—live coverage from the House of Representatives [6 8]	C-SPAN		
TR—24	24	HOME BOX OFFICE [MAX] (East)—time-structured HBO [6 8]	HOME BOX OFFICE		
		THE WEATHER CHANNEL—nation & regional weather/environmental reporting [6 8]	THE WEATHER CHANNEL		
		MSN [Modern Sat Daytime]—program [6 8]	MSN (Modern Sat Daytime)		
		DON KING SPORTS [6 8]	DON KING SPORTS		
		HBO PROMO [6 8]	HBO PROMO		
		USA BLACKOUT [6 8]	USA BLACKOUT		
		OCCASIONA [6 8]	OCCASIONA		
		HBO CINEMA [6 8]	HBO CINEMA		
		HBO [6 8]	HBO		



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BASEBALL  
GUIDE**

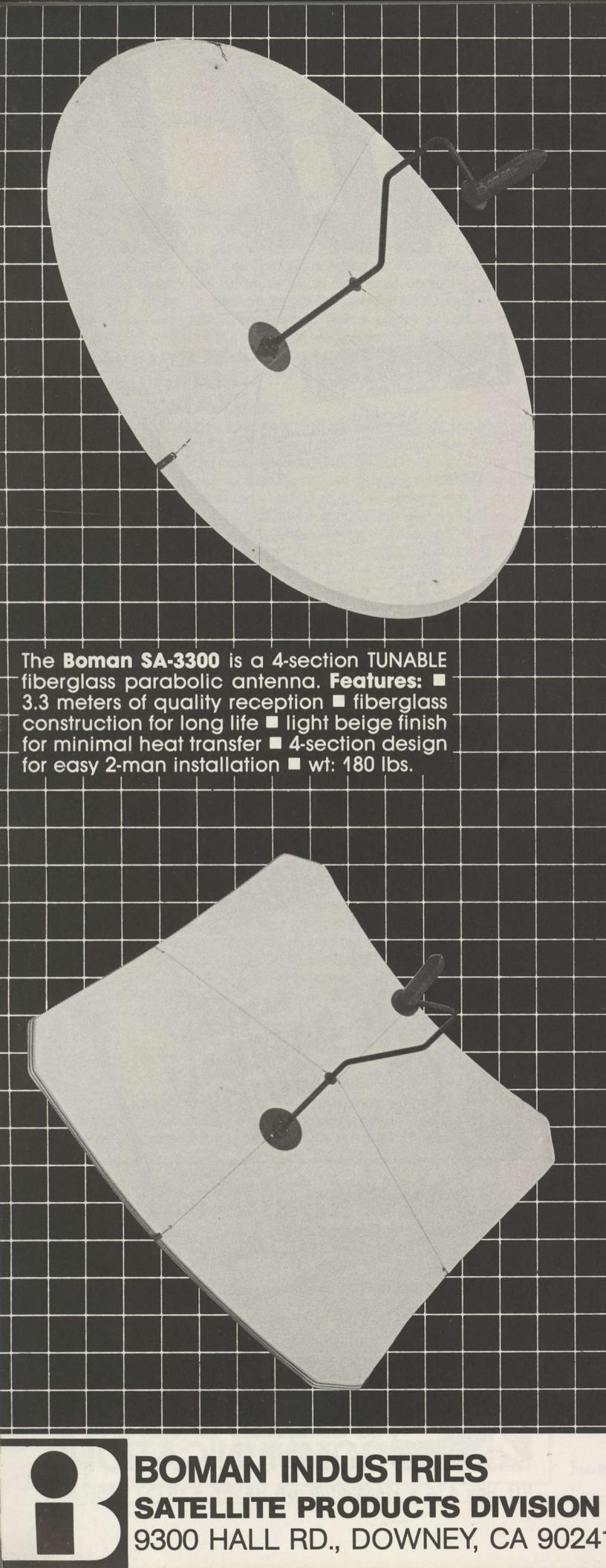
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when they're on  
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May/June 1982

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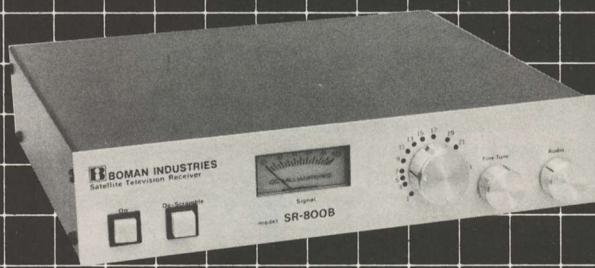
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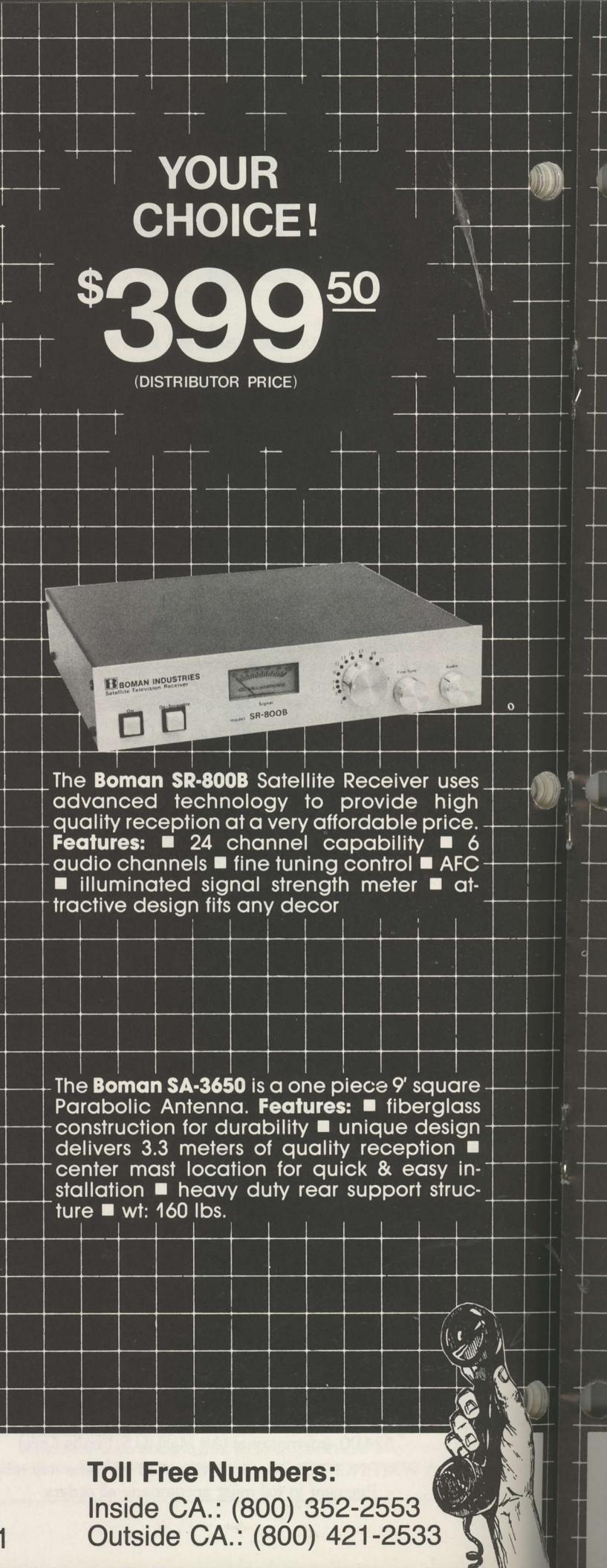
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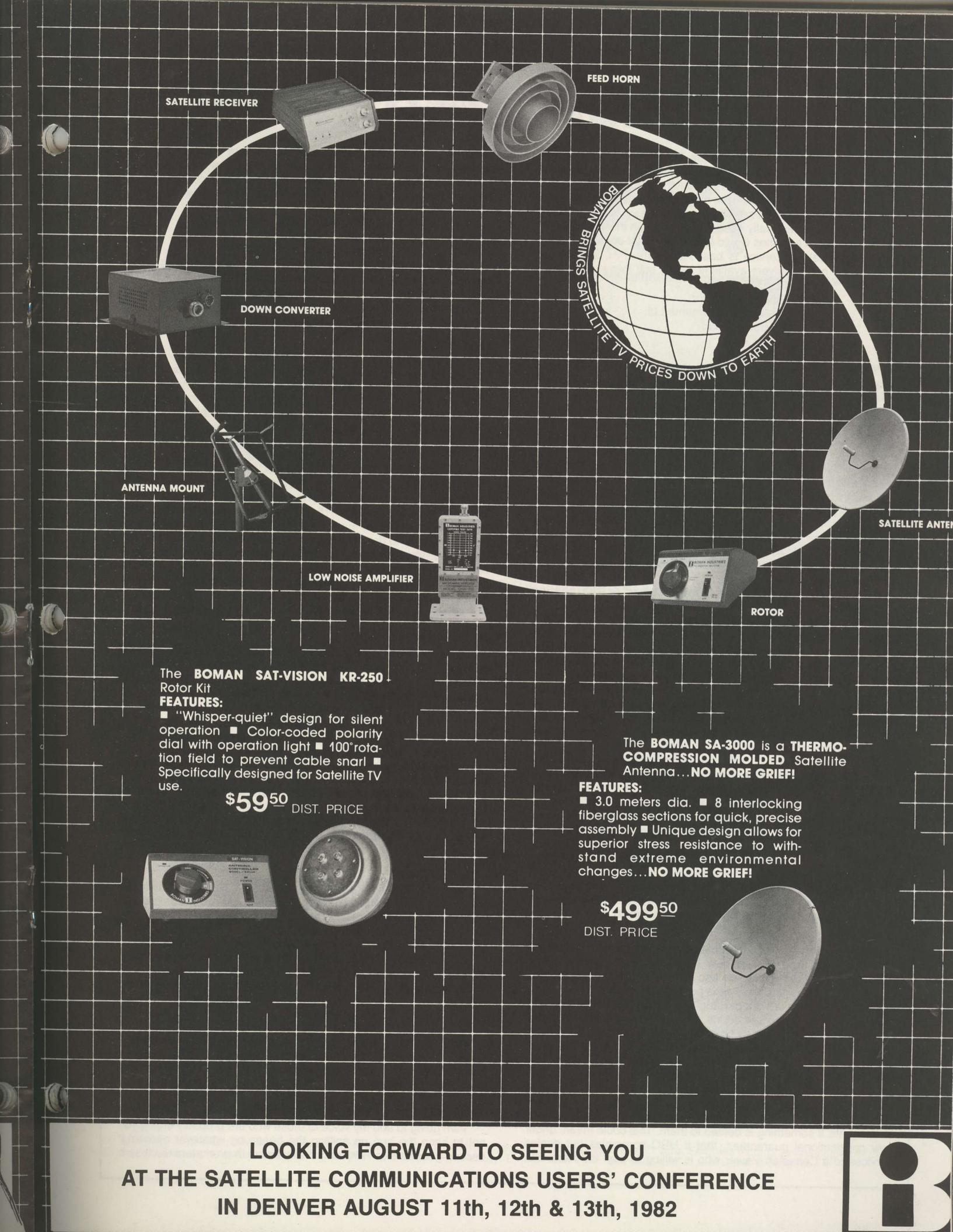


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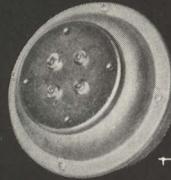
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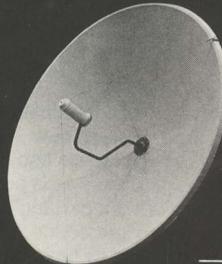


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LOOKING FORWARD TO SEEING YOU  
AT THE SATELLITE COMMUNICATIONS USERS' CONFERENCE  
IN DENVER AUGUST 11th, 12th & 13th, 1982



possibility of home reception of satellite TV, I find that **CSD** tends to assume that readers are accomplished with the various technical terms and abbreviations. May I respectfully suggest that you give thought to a beginners section in the magazine. I am very interested in purchasing and setting up a satellite TV reception system, but I do not know what equipment I really need, nor can I glean this from **CSD**. In your opinion, what satellites would I be able to pick up here in South Africa? Our local TV service is based upon the PAL system and obviously the only receivers available locally suit that system.

R.L. Gooderson  
Managing Director  
ROMLOB Investments Ltd.  
337 Berea Road  
Durban 4001  
South Africa

We do tend to assume that all readers of **CSD** have at least a talking knowledge of the basic satellite receiving system. We make this assumption because **CSD** is designed to be an "insider's publication" for the "trade"; that is, those people who design, manufacture, sell, plan and service TVRO systems of all types. Both private, and, commercial. However, as reader Rogers points out everyone starts out in this business knowing nothing, and as reader Gooderson points out, one may start off with an investment in **CSD** because one believes there is satellite TV in their future, and often after putting in their first terminal, they discover that many of their neighbors, friends and business acquaintances are also interested in having a terminal. There is no question that there are a few secrets in this business. 'Secret' here is defined as something you won't pick up on a street corner. It does not mean that people keep the technology 'secret.' You learn 'secrets' the hard way; by either making the mistakes yourself, and then learning from those mistakes, or from sharing with someone their hard earned knowledge.

Both Mr. Rogers and Mr. Gooderson should invest \$7.50 (\$10 American, overseas) with STTI for the 'Satellite TV Handbook.' This easy-to-read publication is a basic tutorial in what a TVRO system is, how it works, and where you go to get the parts. Coop first wrote this handbook in 1978 (it has been updated several times since) and ANYONE who has an interest in this field should start off with that publication. STTI is found at P.O. Box G, Arcadia, Oklahoma 73007. Something over 60,000 have been printed through the years and many manufacturers have used them in dealer training courses by the gross lots.

Mr. Rogers had best not start peddling 'satellites' door to door until he learns a few more things; number one being that you don't sell satellites! He should attend the SPACE annual industry trade show in Omaha in early August (see SPACE advertisement in this issue) where, as a novice, he can get a full day of basic knowledge along with other novices; followed by three days of advanced stuff.

Mr. Gooderson should contact Bob Behar at Hero Communications (1783 W. 32nd Place, Hialeah, Florida 33012) for exact information on what Intelsat and other services he can expect to receive in South Africa. Hero has recently delivered a number of dishes to Africa, including at least one to South Africa.

#### CONSTITUTIONAL WRINKLE

Canada recently got a new constitution as I am sure most satellite watchers know. And already new legal cases are opening which nobody dreamed of even weeks ago. Censorship of movies is being challenged in some provinces as is pornography. What is happening reminds me of many of the legal tangles the USA went through during the past decade. At the same time, with the new constitution, many questions are being asked by both individuals and provincial governments regarding satellite transmissions. Two lower courts have already ruled on this; the Shellbird Cable example in Cornerbrook, Newfoundland being a case in point. The Shellbird system claims that the CRTC (the Canadian FCC) does not have jurisdiction. It is being appealed and should come up shortly. But the main flow of the new constitution, and those forming interpretations, is that individuals can claim 'rights' if something is denied to them. This could mean, under new constitutional guarantees, that if HBO scrambles but denies services to a Canadian viewer who is willing to pay, the Canadian

authorities might be forced to tell HBO to 'turn off the light' over Canada. In other words, if you offer it, accept payment for it or discontinue offering it. And how could HBO turn off service to Canada, and still provide service in the USA? Chaos may well be coming.

Frank Ogden  
XANADA CANADA  
P.O. Box 3608 M.P.O.  
Vancouver, BC V6B 3Y6

**Chaos Indeed.** HBO is in a 'box' of their own making. They know it and merely trying to 'buy time' to carry them through until DBS gets started. HBO may not directly get involved in DBS, but we expect to see TIME, INC. right in there swinging. It will all come out as one giant melting pot, eventually.

#### TEST EQUIPMENT

Some time ago I thought you mentioned a new test device developed by Tay Howard which determines, without guesswork, if a malfunction is in the LNA, receiver or line. If I wasn't dreaming, I would appreciate hearing where I could get information on this or a similar unit. I suspect I am not the first to run a new feedline, only to later learn it was the LNA that had failed.

Frans A. Davis  
1693 Pleasant Hill Toad  
Lafayette, Ca. 94549

Not dreaming, exactly. Taylor Howard worked with Newton Electronics, Incorporated (2218 Old Middlefield Way, Suite 1, Mountain View, Ca. 94043; 415/967-1473) to create the GBS2000 test set. A more recent model is called the GBS2500; which adds field portability to the original version. It generates a wide selection of signals, from the 4 GHz band down to receiver IF, and they can be sent through the air (connect to a simple antenna) or via cable to check out the performance of the LNA, cable, the receiver, separate downconverter packages, and so on. To the best of our knowledge this is the only TVRO set in the industry today.

#### MAGNATRAC II

Please find enclosed a brochure on our Magnatrac II, antenna positioner and indicator. We have had it in production for several months and it is selling very well. We would appreciate it if you would mention it in the new products section of **CSD**.

Dean Arnold, President  
Big Country Electronics  
Box 3444, Boise, Id.  
83703

Actually, there is no new products section in **CSD**. There is a special Product and Services Directory issue coming up early this fall and this will serve as a last reminder to those who want their products and/or services listed to contact **CSD**'s office at 305-771-0505 for the Directory forms. No charge for listings; if you sell or service equipment in the TVRO field, you are urged to be included!

#### CON ON DOWN?

This letter is a thinly veiled attempt to get a trip to the Turks and Caicos Islands. I read in the May **CSD** that you are thinking about holding a 'Satellite Retreat' towards the end of October. I just wanted you to know that if you need any technical help with the seminar sessions, I am certainly available! I would think it might be difficult to handle 30 people by yourself in a learning environment; I could bring along some test gear and we could do antenna C/N tests and receiver threshold tests. If you need any other reasons to convince you that you need me there, please do not hesitate to let me know.

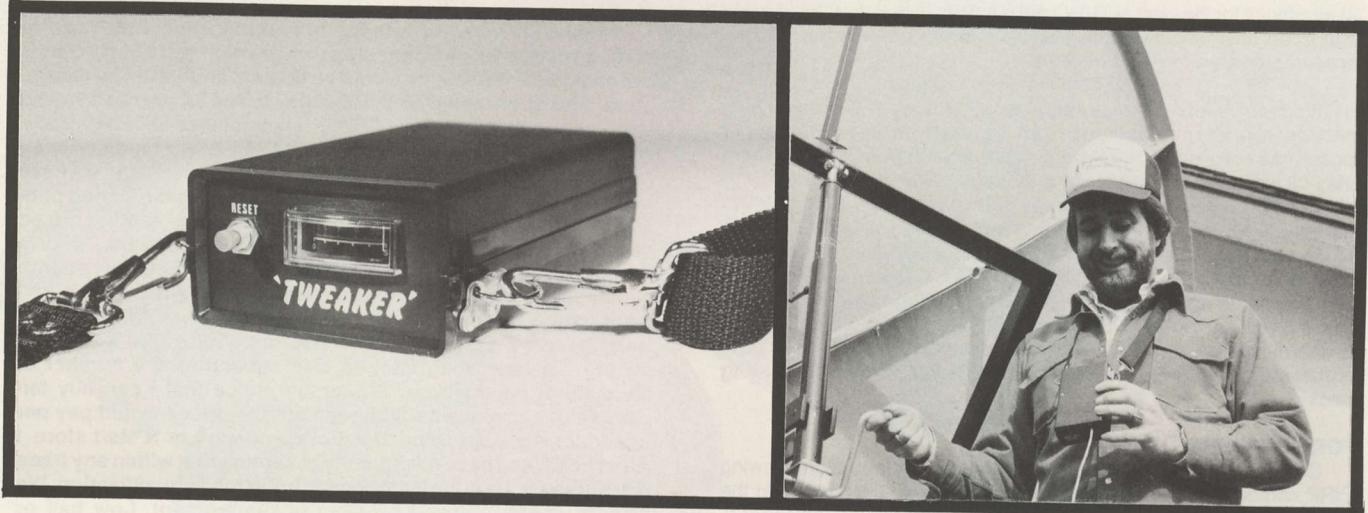
Mike Gustafson  
San Jose, Ca. 95120

**Reaction to a 'satellite retreat' has not been overwhelming.** Other than your 'thinly veiled attempt' to get a gratis ride down here, Mike, we heard from one other fellow in Canada who wanted to know if he could bring his girlfriend along also.

#### NOT FOR PUBLICATION

I am going to add my voice to those who are probably urging you not to jump the gun on spilling the beans on whatever encoding/decoding scheme as HBO may finally select. A premature disclosure

# CUSTOMERS LIKE 'TWEAKER'!



So do distributors and dealers. Why? Because the Satlab 'TWEAKER' \* allows anyone to *precision tune* a satellite antenna. This includes adjustments to the focal length, feed mount, polarity, and parabola — all important in reducing sparkle. Customers especially appreciate the ability to quickly find the *maximum signal* from each satellite thus ending the guesswork associated with "best picture" or "least sparkle." Also, most customer service calls occur because the antenna is incorrectly positioned. With the 'TWEAKER', the customer fixes it himself!

## Everybody likes 'TWEAKER' But don't just take our word for it...

"Your 'TWEAKER' is a must for anyone who wants to get the most out of their system."

Ron Burrows  
Satellite Systems, Inc.  
Belmont, Michigan

"...pays for itself by eliminating expensive service call. When new birds are launched, the customer finds and marks them himself."

Charlie Ergen  
Echosphere  
Littleton, Colorado

"...independible for finding satellites and for proper antenna alignment."

Steve Streeter  
Storm Antenna CATV  
Siletz, Oregon

"My 'TWEAKER' gives me complete control at the dish. I couldn't get along without it."

Joe Fogarty  
Newport, Oregon

"The 'TWEAKER' definitely cuts down our installation and troubleshooting time."

James Redmond  
Starview of Texas  
Dallas, Texas

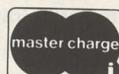
Call your nearest distributor today and find out why the 'TWEAKER' is so popular. No system is complete without a 'TWEAKER'!



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**NORTHWEST  
SATELLABS**



(503) 754-1136

\* The 'TWEAKER' is an electronic metering device that plugs into any receiver or downconverter operating at 70 mhz. Features include variable gain control, push button meter reset, and enough sensitivity to actually "see" satellite variability. Deluxe neck strap, manuals, and 10 feet of cable included.

of which system, and how to defeat the system, has several possible pitfalls. If you show your hand before they make their final, cast-in-concrete decision on which scheme to use, they could certainly then go to a more complex system. Secondly, we could be treating a system that has a number of designer-option variables. A friend of mine taped an HBO scramble test on F4 last week. I noted they were running the horizontal sync frequency up and down, as well as inverting the video polarity at a random rate. Decoding that particular system didn't look at all difficult for the typical TVRO 'whiz kid', but I feel we should really play it cool until they have their five million irrevocably spent, and have accepted delivery on their decoders.

Name Withheld (upon request)

We have heard from several people who feel the same way and as a matter of fact we had figured the same thing out ourselves before the first letters started coming in. We'll let them play all summer and probably by mid fall they will be far enough along that some 'lucky' company will have the contract for the hardware. Several of those writing expressed the belief that the video encoding would be far simpler to decode than the audio, if they really got serious about the audio. PCM (pulse code modulation) schemes abound, and many are good enough security for users such as the US/USSR hotline. We are told that they can probably secure the audio beyond recovery while doing only moderate damage to the video. Silent movies may be coming back!

#### FOREIGN EIRPs

Can you direct me to an accurate source of information showing EIRP contours and available programming for 4 GHz signals in the following areas? Australia, New Zealand, Japan, Western Europe, and, Persian Gulf Area.

Tim Jones  
P. O. Box 164  
Blairden, Ca. 96103

IF (read that twice) you equip yourself with a special 1/2 transponder format receiver (such as a 'foreign modified AVCOM'), a 100 degree LNA, a circular polarized feed and (read that again too) know what you are doing so you can find the audio that goes with the video (seldom on the same transponder), you can marry all of this to a 15 foot dish and do well with Intelsat feeds in all of those areas except New Zealand and southern Australia. In northern Australia, Palapa video is available. In western Europe there are signals galore now, including the Russian Ghorizont series of birds.

#### LISTINGS IN CSD

In the May issue of **CSD**, page 46; the full page advertisement for SPACE. My firm has been a commercial member of SPACE since February 1982. SPACE has informed me that Potomac Satellite Systems is a dealer member, but we are not listed in **CSD**. Please update the Dealer Member list; we greatly need the publicity. Oh yes; we love **CSD**!

Peter C. Foley, President  
Potomac Satellite Systems  
128-1021 S, Barton St.  
Arlington, Va. 22204

The full page for SPACE is donated by CSD to SPACE as a means of making the dealer membership program 'more valuable'. Right now, with the SPACE first annual convention coming up shortly, that page is being used to announce the convention and hopefully entice you to show up! SPACE does update our CSD office once per month with additions and corrections for the normal SPACE full page listing, and there is typically a four week or so lag/lead time built into their changes and those changes appearing in print.

#### LIST PRICING

I started reading everything Coop wrote back when he was editing **CATJ**, and still do. I think he has helped this industry more than anyone, but I think it is about time to put the **DIGEST** in a position to help the dealers and manufacturers who are trying to make an honest living by stopping all pricing that is not full list.

When I can walk into the home of a prospective buyer and see a copy of **CSD** sitting there, I immediately know that I cannot make a fair profit. The guy instantly holds up **CSD** and says "But LNAs cost \$500!". Let's face it, the **Digest** is getting bigger every month and not all readers are in this business. I realize it might be difficult, but can we consider stopping all pricing in **CSD**?

Gerry B. Blachley, Inc.  
Simi Valley, Ca.  
93065

When **CSD** began it was the only publication and it had to serve a wide variety of interests, from the hobbyists (most of us fit that category at the time) to would be dealers and would be distributors. And, even would be TVRO owners. The **Digest** has evolved into a dealer/distributor publication, a business or trade publication for the industry. We feel that the \$50 per year subscription rate 'screens' many of the would be system owners, and we have stopped our heavy promotion of **CSD** in consumer oriented publications. **SatGuide** had a similar problem with accepting priced advertising, but it was clearly a book going to end users. There is no other way to account for their purported 18,000 per month circulation. Virtually every trade has a trade publication, and there, when the readers are largely resellers of whatever the trade handles, you see dealer and distributor (i.e. wholesale) pricing. I dabble in agriculture, and subscribe to a number of agricultural publications. I naturally notice that I can buy ten pounds of carrot seed for about 1/5th the price I would pay per pound for the same seed at a Florida nursery or K Mart store. I expect this, and have no difficulty accepting that within any trade there are various price levels based upon buyer qualification. We have a unique growing problem at the moment. Low ball or wholesale pricing usually accompanies a qualifying process where the seller screens the buyer and determines whether he is actually entitled to a lower price. Either this screening process is missing in our industry, or people are easily talked into selling wholesale to what is obviously a one time retail buyer. In either event the solution to the problem has to begin at the point of sale. Priced advertising, to and with the trade, serves an important function. Pricing levels do change, dealers do shop around, and priced advertising makes it possible for an alert dealer to maintain his profit margins or even improve them. A year ago we were seriously considering starting a second publication, oriented towards the end user or would be user, with newsstand circulation/distribution. We haven't given up on that, yet, and if such a publication does come from **CSD** it certainly will not accept priced advertising that lists prices lower than, as you suggest, 'full list.'

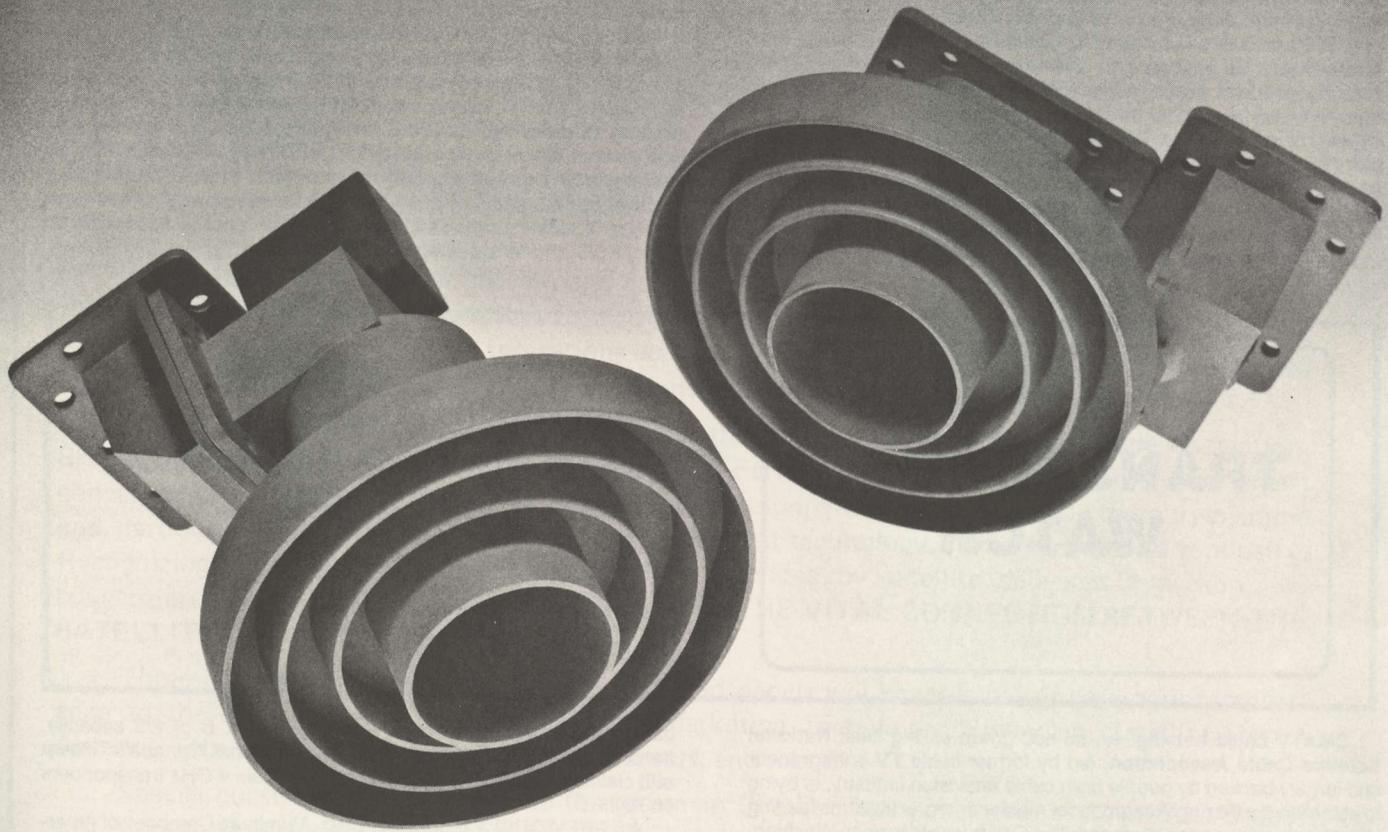
#### A TVRO LICENSE?

On page twenty nine of your 'Satellite TV Handbook' you mention that TVRO terminal licensing is optional. I am trying to put together a home owners association shared TVRO system, and with the amount of money we will have invested, I wonder whether it would be wise to go ahead with a TVRO license.

Frank M. Walker  
Orlando, Fl. 32812

Originally, the FCC required all TVRO (television-receiver only) terminals to be licensed. To obtain a license, you had to show on paper a very detailed outline of your proposed system, and show that you had the financial ability to complete the project if you were granted a license. You also had to show that you had the permission of at least one satellite program supplier to 'access' their transmissions. There was a mountain of legal paperwork, and an even larger pile of technical paperwork. This process shortly became computerized but it still cost around \$1,000 to get the job done. In October of 1979, the FCC, reacting to a series of petitions filed with them (including our own) decided to make TVRO terminal licensing optional. Under the revised rules, you could go ahead and get a license if you wished, or you could simply build a terminal and operate it. The reason extended for having a license was that those licensed terminals would be accorded the 'opportunity' to protest, with legal foundation, if some terrestrial microwave service firm (such as Bell) decided

Two New Products from Chaparral:



## POLAROTOR™ DUAL FEED II™

### POLAROTOR™

Change Polarization without a Rotor, and with Performance that Equals the Chaparral Super Feed™.

With the Chaparral Polarotor™, antenna polarity can be changed in less than half a second. Inside the circular waveguide of the Polarotor™, a probe is rotated by a small servo to any position over 180 degrees with one-degree accuracy. The feed and the LNA remain fixed. Only the probe moves.

### DUAL FEED II™

Performance and Economy, with Chaparral Quality

The Chaparral Dual Feed II™ applies an innovative design to produce a high-performance orthomode feed at low cost. For compact installation, both LNAs can be mounted to the rear. VSWR is better than 1.4/1, and isolation is at least 30 dB.



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Chaparral: Innovative design, Imaginative engineering, Quality manufacturing.

they wanted to build a terrestrial microwave link near enough to you to cause you interference with your TVRO. If you had a license, you could protest that application to build a terrestrial network or circuit and if you protested, the FCC might decide in your favor and deny the terrestrial firm a license to build on top of you. Without a license, the FCC would not know you were there, and would not accord you the opportunity to protest. That sounds good on paper. However, it turns out that you have to somehow be aware that an application to build such a terrestrial system is in the works. The way the rules work, it is the responsibility of the TVRO licensee to keep abreast of such applications, and to protest in a timely fashion when he becomes aware that such an application is being tendered. In protesting, you will have to attack the application's engineering, and prove that it will cause your licensed terminal interference. To be aware that you

are threatened, you'll have to figure out how you can stay on top of the daily filings with the FCC, and know when one filed might impact on you. Then if such an application is filed, you'll have to engage an engineering firm and probably an attorney to file a protest. A simple letter "they cannot do that here" will not hack it. Is it worth it? The cost of such a license is still near \$1,000 although the paperwork has been reduced from 1979. They no longer, for example, want proof of your economic ability. Getting the license is the easy part; it merely costs money. Protecting that license against all potential intruders is the tough part. If you miss just one crucial day's applications filed with the FCC, that could be the day when somebody files 'on top of you.' It will probably take an hour or so a day for you personally to stay up with the filings, and you'll spend perhaps \$100 or more per year to subscribe to some FCC notice service. You figure it out!

## TRANSPONDER WATCH

### RECENT REPORTS OF ACTIVITY ON DOMESTIC / INTERNATIONAL SATELLITES

Send your reports to CSD Transponder Watch, P. O. Box 100858, Ft. Lauderdale, FL 33310. For late news, call (305) 771-0505.

**SMATV** battle forming. An ad-hoc group calling itself **National Satellite Cable Association**, led by former cable TV entrepreneur and largely backed by people from cable television industry, is trying to establish itself as spokesgroup for master antenna systems feeding apartments and condos, from satellite. Group wants to open Washington lobby office, fund full time administrator. SMATV 'division' of SPACE, meanwhile, is attempting to negotiate 'marriage' between two groups. SMATV folks view SPACE efforts as largely on behalf of **private** terminal owners, and fail to see the clout they can attain if they 'marry' a group that many label as 'pirates'. Biggest issue facing SMATV folks is the hard line policies adopted by major premium movie service packagers who now almost to company refuse to authorize SMATV systems to carry services, under contract and for pay. SPACE suggests that the withholding of product has gotten so far out of hand that only anti-trust suit, brought by SPACE/SMATV folks can turn issue around. Negotiations between two groups continue.

**IF YOU** want to learn more about SMATV, talk with Eagan and Associates who are holding Denver seminar (late July) and Kansas City seminar (late September). Telephone 904-351-5400. Admission fee is \$375.

**RUSSIAN** Ghorizont bird operational at 14 west appears to have a 42 dBw spotbeam level into western Europe, 35 dBw hemispheric and 31 dBw global. The (USA receiver channelization) TR9 31 dBw footprint is the one seen in North America and South America. Russian MOLNIYA birds (they have an inclined orbit; see CSD for July 1980) have **three** 40 watt transponders on global beam configuration, operating with center frequencies of 3675, 3775 and 3875 MHz; the latter is the one that normally carries television and which can be seen in North America.

**OVERLOOKED** by preoccupation with new US domestic birds, by many, is scheduled August launch of first 24 transponder C band bird for Canada's ANIK. Bird is likely to take station at 104 west where original ANIK 1 operated, and have full operational capabilities around the first of November this fall.

**CANADIAN** regional TV services will be operating at 12 GHz as follows: Atlantic Television Systems (ATV) and Newfoundland Broadcasting Company (NTV) will operate on an 'eastern spot beam' on ANIK C. Inuit Broadcasting Corporation will televise to native resi-

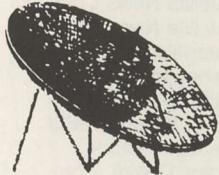
dents of far northern Canada, first using ANIK B or 2/3 capacity, transferring to ANIK D when it becomes operational. Canada's Telesat still claims an unidentified US firm will lease six 4 GHz transponders on ANIK D.

AS PREVIOUSLY reported in CSD, Aluminum Company of America (ALCOA) and NEC (Japan) will jointly create home TVRO terminals for the forthcoming 12 GHz service. Antenna sizes will be from 2 feet to 6 feet and the company will operate out of the NEC headquarters in Elk Grove, Illinois.

**SCIENTIFIC ATLANTA** apparently failed to complete contract to Globo network television stations in Brazil, prior to June 1st deadline. Globo had ordered approximately 35 terminals for remote network affiliate stations scattered in Brazil's 'outback', to allow them to bring in the World Cup Soccer games from Spain. How many terminals actually were installed, prior to June 1, is not known. At least one Globo affiliate flew to Miami, purchased six meter terminal from Hero Communications, and hauled whole dish and system back home with him as 'excess baggage' (!). And just to put the broadcaster into perspective; his station operates on a UHF channel with 100 watts of power serving a small town in remote northern Brazil.



# SPACE CONVENTION and EXHIBITION



August 4-7

## Omaha, Nebraska

The spectacular growth of private and commercial earth stations in recent years distinguishes it as one of the new and exciting industries of the 1980s. The frontiers of this new technology are just now being explored — and all indications are that earth station reception of satellite transmitted programming will revolutionize the way Americans receive video entertainment in their homes.

Demand for this technology is so tremendous that the earth station industry trade association, SPACE (The Society for Private and Commercial Earth Stations) has put together the largest convention and exhibition of satellite earth station equipment. You'll want to be there to examine and participate in demonstrations of the most advanced technology in the earth station industry. Recognizing the growing business opportunities provided by satellite delivered television, the convention's theme is **THE DEALER/RETAILER — THE VITAL CONNECTION BETWEEN THE SATELLITE AND THE CUSTOMER.**

Three information-packed days of seminars and panels will cover issues of paramount importance to the earth station industry, including: Marketing Techniques, Financing, Satellite Master Antenna Television, Legal Issues, Technical Aspects, and more.

Special guest speakers will include Congressman Charlie Rose (Chairman of the House Broadcast Committee) and Congressman Billy Tauzin (member of the House Subcommittee on Telecommunications), as well as other public leaders in the communications field.

SPACE will hold a special "pre-conference" orientation seminar on August 4 for prospective earth station dealers. Individuals new to the industry, who are considering becoming earth station dealers, will find this an informative and important opportunity to learn about earth stations.

No other event this year is more important — plan to be there August 4-7 in Omaha, Nebraska.

#### CONVENTION REGISTRATION:

Registration fees for the SPACE Convention and Exhibition August 5-7, 1982, are:

General Admission. . . . . \$150.00  
SPACE Dealer Members . . . . . \$ 50.00

I will attend the Pre-Convention Intensive Seminar for new dealers on August 4, 1982 (no additional charge.)

Please enclose a separate check payable to:

**SPACE Convention Fund** in the amount of your registration fee.

#### HOTEL RESERVATIONS:

A \$60 deposit will reserve all rooms. Please make a separate check for hotel reservations payable to Holiday Inn. Your registration will be confirmed.

Room rates: One double bed. . . . . \$39.00  
Two double beds. . . . . \$44.00  
One king size bed . . . . . \$49.00

My registration fee (check payable to **SPACE Convention Fund**) is enclosed.

My \$60 room reservation deposit (check payable to **Holiday Inn**) is enclosed.

Individual Name: \_\_\_\_\_

Company Affiliation: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: (\_\_\_\_\_) \_\_\_\_\_

Type of room desired (indicate order of preference):

One double bed \_\_\_\_; Two double beds \_\_\_\_;  
King size bed \_\_\_\_

Number of persons per room: \_\_\_\_\_

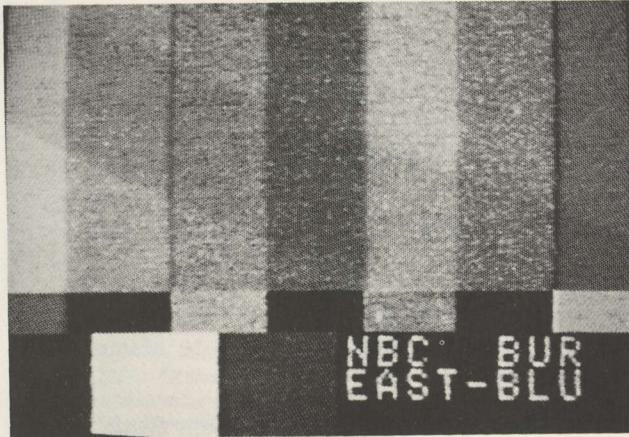
Date of Arrival: \_\_\_\_\_ Number of nights: \_\_\_\_\_

Mail form and checks to: Space Convention c/o Holiday Inn,  
3321 South 72nd Street, Omaha, Nebraska 68124

**CANADIAN** and US officials have begun the long process of negotiating a new agreement to allow the 'transborder exchange' of television and radio transmissions via satellite. Present agreement, reached in 1971, forbids such exchanges except under emergency situations.

**ABC** plan to bring scrambled first run movies into homes via affiliates, in wee morning hours, has met with considerable approval from affiliates. ABC told affiliates "... the new technologies are not the wedge that will drive us apart; rather they are the glue that will bind us together".

**NBC** now claims that by middle of 1984, they will replace distribution to affiliates via landline (cable and terrestrial microwave) with satellite feeds. NBC has been promised up to 9 (4 GHz) transponders, from AT&T (Comstar and successors) by start of 1984; NBC still trying to decide whether to use **existing** 4 GHz birds, or spring into 12 GHz birds directly with network feeds. NBC presently claims they are testing network feeds using COMSTAR D3, TR1; tests will complete by October of this fall. NBC expects to begin 'phased terminal installations' by middle of 1983.



**CBS** has decided, **also**, to switch to satellite feeds. The network says they will scramble a pair of transponders with addressing of receiver terminals, initially; they have a late 1982/early 1983 time frame in mind, will feed to about a dozen affiliates in southwestern US first, expand gradually to Pacific time zone. Next on the time schedule are feeds to offshore Atlantic and Caribbean affiliates (Bermuda now authorized to get live US satellite feeds). CBS plans to have affiliates install primary seven meter antenna, with backup 4 meter antenna. The network has leased or made arrangements to lease up to 8 COMSTAR transponders.

**SATELLITE NEWS** Channels was to have begun Westar 4 multiple channel service on June 21st. Service is expected to move to WESTAR 5 when (or if) launch proves successful and WESTAR 5 bird is fully operational.

**WESTAR 5** launch went off with no major hitches; bird is now being groomed into a testing position (either 79 west or 139 west), and video tests should be seen as you read this. Western Union hoping for turn on date with service as early as July 15th. Many of the present Cable programming services on Westar 4 will move to 5.

**WESTERN UNION** has released **tentative** transponders groupings for WESTAR 5 bird. The list can be expected to undergo some modifications before the bird actually begins service, but for now it looks like this:

Transponder 1 (horizontal)	Hughes Television Network
Transponder 2 (vertical)	CBS Television Network
Transponder 3 (horizontal)	WOR
Transponder 4 (vertical)	Dow Jones (data)
Transponder 5 (horizontal)	CitiCorp (data)
Transponder 6 (vertical)	Dow Jones (data)
Transponder 7 (horizontal)	CBS Cable
Transponder 8 (vertical)	Satellite News Channels
Transponder 9 (horizontal)	Amsat
Transponder 10 (vertical)	Amsat

Transponder 11 (horizontal)	Satellite News Channels
Transponder 12 (vertical)	Amsat
Transponder 13 (horizontal)	Amsat
Transponder 14 (vertical)	Satellite News Channels
Transponder 15 (horizontal)	Satellite News Channels
Transponder 16 (vertical)	Satellite News Channels
Transponder 17 (horizontal)	Nashville Network
Transponder 18 (vertical)	Disney Network
Transponder 19 (horizontal)	CitiCorp (data)
Transponder 20 (vertical)	UTV (January 1983)
Transponder 21 (horizontal)	Disney Network
Transponder 22 (vertical)	Digital Comm. Corp.
Transponder 23 (horizontal)	Group W
Transponder 24 (vertical)	Black Entertainment Network

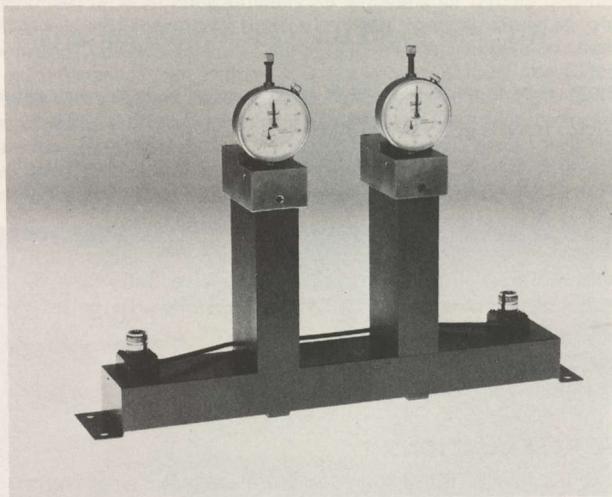
All channels identified as Satellite News Channels, Nashville, Disney or Group W are actually held by Group W, and musical transponders **within** single leasor holdings can be expected. Black Entertainment Network **may** swap with 9, 10, 12 or 13 **before** becoming operational in August/September.

**WOR** scheduled to move from F3R, TR17 to Westar 4 as temporary home at midnight June 30th. Replacing WOR on F3R is new Cable Health Channel service; 24 hours per day. WOR will be on Westar 4 only briefly, moving to Westar 5 before this month is over, in deal cut with Robert Wold (Communications).

**RCA's ENTERTAINMENT CHANNEL** went on as scheduled (TR8, F4) on June 4th. The New 24 hour service relies heavily on original theater, some selected movies, and much BBC and other European fare. Service is a pay channel service, trying to place itself about half way between HBO and CBS Cable service. Cable industry reaction, prior to service 'launch', had been less than enthusiastic. How RCA will cope with redirecting service, if it fails to pick up steam for balance of this year, is conjecture.

**CBS CABLE**, meanwhile, may be going through a major change itself. Lack of advertising support for cultural service has CBS planners looking at other ways to make the service self liquidating. CBS lost several million dollars on service in first six months of operation.

**MICROWAVE FILTER** Company has a series of new earth station interference traps for private terminal systems. Included is 4 GHz trap with 10 MHz offsets. Also newly available is terrestrial frequency analyzer system that allows user to field tune tunable, calibrated wavemeter to trace down interfering carriers. By using analyzer system, installer can pinpoint the exact carrier frequency (ies) causing problems, and then order suitable 4 GHz traps from standard product lines. Information from Microwave Filter Company (6743 Kinne St., E. Syracuse, N.Y. 13057; 1-800-448-1666).



**BIZNET** is the new name for the United States Chamber of Commerce television service which will formally dedicate on October 4th. Using TR15 on F4, sub-let from Westinghouse, Biznet will supply five hours of programming, five days per week (9 AM to 2 PM eastern). Programming on the service will be designed to enhance the promotion of business activities nationwide, with a mix of inter-active two-



## For their Satellite Feeds Broadcasters Demand Hero Communications Super 'Tenna Quality.

The pioneers of the consumer Earth terminal market now offers a complete line of SUPER-TENNA SYSTEMS and Accessories

- 12 ft., 16 ft., and 20 ft. SUPER-TENNA SYSTEMS
- Lightweight, all aluminum antenna
- Micro-Grid surface for less wind load
- Fully motorized 'horizon to horizon' polar mount
- Custom designed systems for home and commercial applications
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Why take a chance on an unproven product?

**Select the 'Field Proven' choice of the professionals.**

For more information and the dealer nearest you, contact the 'professionals' at HERO COMMUNICATIONS OF FLORIDA.

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way meetings, luncheon type addresses intended to give local Chambers national speakers for business meetings, and a host of business promotion and 'lobbying' activities. Terminals are to be supplied from either M/A COM, or SA and are priced in the \$16,000 region. The feed will be encoded using the Oak Orion system, and for those firms paying the \$5,000 annual fee to 'subscribe' to the service, there will be a one time purchase price charge of \$1,000 for the Oak decoder.

**AUTOMATION TECHNIQUES** claims to have developed sparkle reduction system for a new receiver. Firm claims that (patented) system allows performance of 15 foot dish with 11 foot terminal, at premium cost per receiver of approximately \$500 per unit. First units to be available around August 1st. Contact ATI at 918/836-2584.

**BRAZIL** has elected to allow combine including Hughes and Spar Aerospace (Canada) to build satellite system. Target date for operation is mid '85 with birds almost identical to recent Western Union (4 and 5) birds. Birds will have one refinement; 24 transponders with six on-board spare transponders.

**XEW** feeds now carried on Westar 4 are intended to bring Mexico's largest network into SIN network stations in states. Look for reverse feeds on this transponder before summer is over; carrying US programs into Mexico, largely from SIN in states, but also including news feeds and remotes for broadcast on XEW terrestrial service.



**PRESENT** use of Intelsat bird at 53 west for Mexican domestic TV relay is a 'test'. The bird in use is due to be replaced very soon, with later version satellite that will maintain vastly improved 'station keeping'. As many as three Mexican network feeds have been seen simultaneously from this test bird.

**ESPN** now using 6.2 MHz audio subcarrier twice per day (9:30 AM and 12:30 PM, ET) to give affiliates 'updates' and instructions for program feeds: TR7, F3R.

**WESTAR 4 UPLINK** is on grounds and operational for duration of Knoxville World's Fair; system installed by Videostar in Atlanta, and is available to TV networks and broadcasters who want to do feeds from fair. Several have already put the system to use.

**SPACE** efforts to get language into pending Goldwater Bill (S.2172) exempting private, home terminals from severe criminal penalties may be bearing fruit. Markup on the bill scheduled at about the time you read this; stay in touch with SPACE (202/887-0605) to find out latest, and when your assistance is needed in contacting your Senator and/or Congressman.

**FRENCH**, not known for going along with the crowd, have now determined that 'French National Interests' will be best served by 'cabling all of France' (possibly with fiber optic cable), and not participating in any of the many now-forming European inter-domestic satellite projects. French feel that if direct satellite reception gains foothold in Europe, and France, their 'control' over what the public sees and hears will be lost. They plainly don't care for that, and to offset loss of national participation in any multi-national satellite systems, they will instead promote multiple channel (pay and other) cable service nationwide.

**CAMPUS CONFERENCE Network** is latest brainchild. Service would interconnect colleges and universities throughout nation for

combination of entertainment (big name entertainers do well on campus tours) and teleconferencing. Public Service Satellite Consortium (Washington, DC) is behind project.

**CANADIAN** pay TV interests still angry over Telesat decision to lease transponders to early-bird American DBS operators on ANIK C 12 GHz bird(s); more angry at decision to 'adjust' boresight on ANIK C3 (first bird up) to favor northern USA. Whole mess would sort out by middle of 1983 when additional C3 birds will be available, but in interim, Canadian pay folks view Telesat decision as counter to proper development of Canadian 12 GHz pay TV services.

**MULTI** standard TV monitor (video and audio in) has a new entrant; JVC has a new 13" unit that features PAL, PAL-M (Brasilian feeds only), SECAM, NTSC and modified NTSC. Price is quite reasonable; \$710 suggested retail.

**PAL-M** decoder, now being advertised, is probably not for you. Unit offers conversion from PAL-M to NTSC for \$500 range outlay. Problem is PAL-M is a set of standards exclusive to Brazil, and while there is a market for same in Brazil, there is only one (Intelsat) transponder that offers PAL-M service. There's a better, more universal way to do it.

**SENATOR HARRISON SCHMITT** of New Mexico is urging Senate not to ratify the 1979 World Administrative Radio Conference (WARC) agreement in US, pending further studies and until after regional conference scheduled for 1983. Schmitt feels US position will be stronger at 1983 conference if US withholds agreement on satellite orbit spots until after further negotiations.

**US GOVERNMENT** has issued final ruling on alleged 'dumping' of high power uplink amplifiers in US by NEC/Japan. Commerce Department found NEC guilty of selling below fair market price; buyer was COMSAT.

**ARIANE** launches getting squared away after combination of bird and launch vehicle problems. Next communication satellites of interest to be launched are Intelsat V (F7) scheduled for March 1983, F8 May 1983 and F9 late July/early August 1983. First US domestic bird scheduled is WESTAR 6, December 1983.

**VITALINK**, which pioneered 12 GHz terminals in US, has cut unique deal with Western Union. WU is selling Vitalink a pair of 12 GHz transponders, and Vitalink is selling WU an ownership interest in Vitalink. This is first move by WU into receiving hardware systems.

**WHERE IT IS** department. If you catch 'Roaring Creek Earth Station' on satellite feed slide, it originates from new Intelsat terminal owned by Comsat near Bloomsberg, Pennsylvania.

**BERMUDA** reportedly has dropped all of the barriers to interconnection of Atlantic island nation with US domestic satellites. Pending were several proposals to bring US premium and satellite network programming there. Government unexpectedly approved **ALL** applications pending, including two for cable and one for over-the-air UHF scrambled multiple channel service. Next step will be finite negotiations with US program suppliers and individual approvals by US FCC.

**TELEFRANCE** will grow to 4 hours per night on SPN (TR22, W4) September 1st; and then to six hours per night in March of 1984 after SPN has moved to next 'home.'

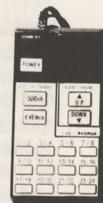
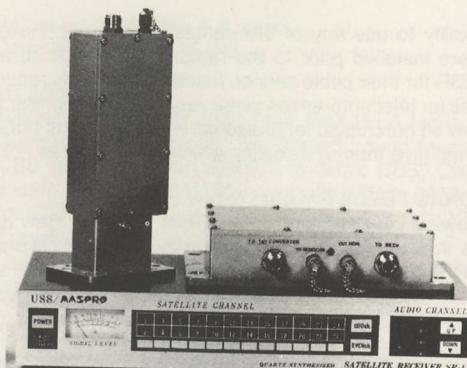
**CNN** has reached agreement with TV Asahi and Japan Cable Television to provide 17 hours per day of CNN service via Intelsat to Japan. Agreement follows similar deal CNN made with Australian firm; both feeds are set to begin around January 1.

**BLACK**, stereo, radio network plans to inaugurate national service via audio sub-carriers on NCN (TR7, F4) by end of summer.

**SECOND** black oriented national television network, Inner-City Broadcasting, has purchased a transponder from RCA for Satcom 4. They are aiming for a six hour per day format, starting in October. Live theater and live black music is planned from a renovated Harlem theater.

**HBO** transponder 18 will be put into fulltime service for TIME Inc. (HBO parent) teletext service **testing** as soon as September. Use of F4 transponder is considered interim choice with a more final choice to be made after service testing is completed.

**FCC** expected to approve DBS service (up to now, all of the 'smoke' you have heard or read is for a service yet to be approved!) by



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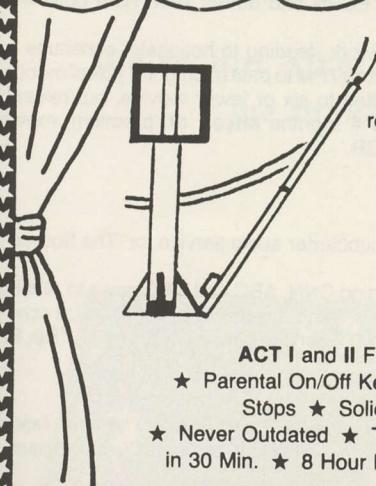
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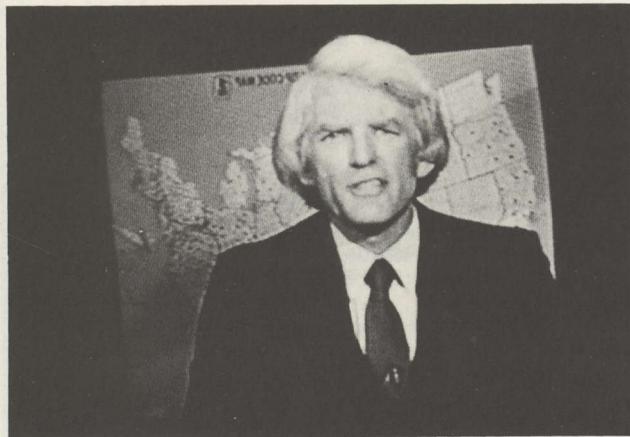
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the middle of July. FCC approval may be easier part of show. Many expect volume of federal court challenges, citing lack of specific authority in 1934 Communications Act for FCC to approve a 'national' broadcasting service like DBS. It won't be all over when FCC grants 'licenses.'

**DBS.** If you have a serious possible use of DBS service, or equipment, Orrox (they manufacture 12 GHz receiving equipment) has a short (under ten minute) videotape available for loan, explaining 12 GHz DBS. Call (408) 286-6000 (extension 28) and talk with Mimi.

**PERSISTENT** rumors that Caribbean island of Jamaica may become 'offshore' creator and uplink site for DBS programming to serve wide area of North and South America, continue. Under forthcoming 1983 meeting which will allocate DBS orbit spots to nations in western hemisphere, Jamaica is entitled to at least a single slot. US business people, backed by South American business people, are making overtures to Jamaica to entice it to fight for additional spots, with promises that if they are won in hemispheric negotiations, large telecommunications origination 'industry' could come to Jamaica.

**NATIONAL** Microtech's May 14 and 15th satellite delivered earth station symposium was good first time effort, showing what aggressive firm with eye towards future can do. NM used satellite feed to show off products, acquaint dealers and would be dealers with NM capabilities, and to push concept that 4 GHz DBS is in fact already here. NM uplinked from Washington, DC and used professional video firm to produce the event; plus, backed it up with advertising campaign in national TV GUIDE magazine.



**MARRIOTT** hotels have now jumped on the teleconferencing bandwagon. VideoStar Connections, an Atlanta firm, has been signed to package the hardware as well as the satellite time. Unlike Holiday Inn and others who are using their TVRO terminals to bring in premium (i.e. HBO et al) programming, and adding teleconferencing as a sideline, Marriott will only deal with teleconferencing and terminals will

have the ability to use any of the domestic satellites. Holiday Inn systems were installed prior to the rapid growth in birds, and are locked on F3R for their cable service feeds. This greatly reduces the opportunities for teleconferences since very little transponder time on F3R can now be purchased for teleconferencing. Marriott hopes their 'late entry' will give them a flexibility which Holiday does not have.

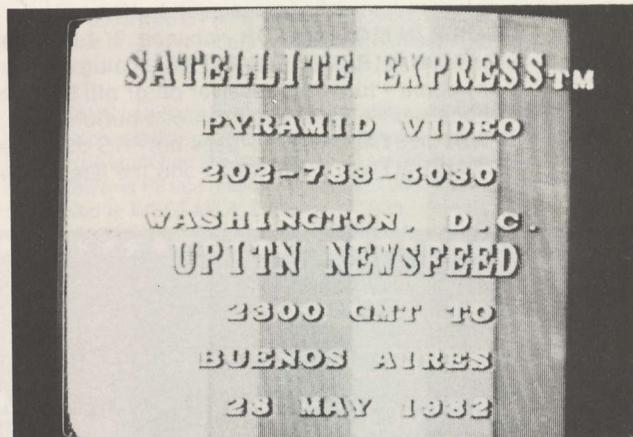
#### OCCASSIONAL FEEDS/Recent

The following data is provided as a tool to assist 'new antenna installations' in determining the bird they may be pointed at and is not intended as a program guide nor schedule. In as much as the satellite operators may assign and re-assign uplink operators to various transponders (and birds) to suit momentary traffic loads, the accuracy of the following changes daily and certainly monthly. However, it does provide you with a guide to 'use patterns' and may be of considerable use when you are attempting to locate a specific type of feed in an 'emergency' situation. **Regular**, 'scheduled' feeds are not shown here; you will find them in **Channel Guide**, **SatGuide** or **Satellite TV Week**. All times noted are ET (eastern time zone).

#### RCA F4/83 West

TR3 / RCA continues testing of this transponder, typically 24 hours per day.

TR11/ MTI TOC (Toll Operations Center) noted uplinking UPITN feeds to Buenos Aires (for Argentine National television) around 7:30PM weekdays; also noted uplinking domestic news feeds as late as 9 PM weekdays.



TR18/ Sport backfeeds for ESPN and others seen here quite frequently during June.

TR19/ American Movie Network (feeding to hospitals) continues to feed movies nightly from 7PM to past midnight. Typical month-long selection is limited to six or fewer movies, but release dates are from 2 to 4 months **ahead of** 'premium' movie services found on F3R.

#### RCA F1/135 West

TR 1/ WOLD LA

TR 6/ CW carrier with 6.2 subcarrier audio service for 'The Source'; music and news.

TR 8/ Wold LA service feeding CNN, ABC and NBC news to Alaska **now moved** from TR8, F2 to this transponder. Service schedule reduced and AFRTS service previously found on TR9, F2 no longer reported.

#### COMSTAR D3/87 West

TR 1/ NBC use of this transponder (5.8 audio) largely for news feeds now inward bound from overseas (i.e. London) via Intelsat.

#### COMSTAR D1/D2 (95 west)

TR12/ NBA playoffs backfeeds from LA (5.8 audio); color bar testing 8:30 AM.

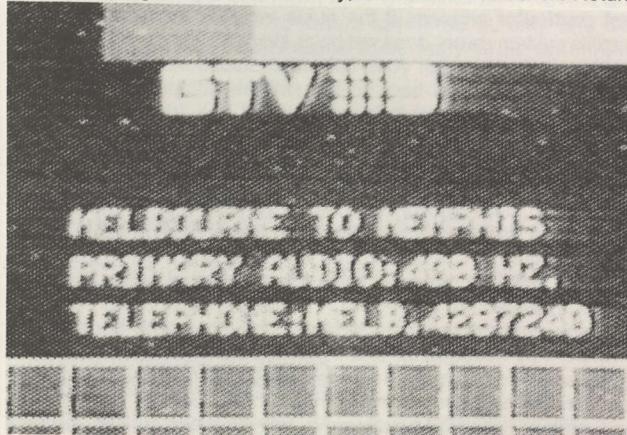
TR14/ ATT Long Lines testing; UPITN feeds 4 PM; CBS sports backfeeds 8:30 PM.

TR17/ CBS Morning News (7:30 AM) preceded by CBS Sunrise

Semester (6:30 AM); 5.8 audio.  
**TR24/** Color bar testing 5:15 PM.

**WESTAR 3/91 West**

TR 1/ Blairsat commercials feed 7AM; WOLD LA feeds 8PM.  
 TR 3/ Buenos Aires (Sheraton BA) inward bound feeds for CNN, CBS and NBC seen 6:30AM to 8AM; CBS, CNN London inward bound feeds London typically 7AM to 8AM. WOLD LA for CNN seen 6PM feeding CNN Los Angeles; KRON (San Francisco) on-air service and feeds seen 7PM.  
 TR 5/ Good Morning America (Chicago) John Coleman weather feeds to NYC seen weekday mornings 7AM to 9AM; Miami CBS affiliate WTVJ uplinks with news feeds to CBS NYC seen 6PM.  
 TR 9/ One-shot Memphis feed to GDB9 (Melbourne, Australia), special program on Elvis Presley, seen 7AM to 8:30AM. Return



feed from Melbourne seen on TR17 at same time. ABC (Max

"R") insert feeds to NYC seen weekdays 6PM (6:30) to 7:30 PM. CBS feeds, sports from Philadelphia, seen 8PM. Full World News Tonight (ABC) seen here occasionally 7:00-7:30 PM. NBC Nightly News seen 8:30PM weekdays. Portions CBS Sunday evening schedule seen in ET feed, split with TRs 15, 21.

**TR15/** 7AM (and prior) Dallas (KDFW) on-air service and feeds, Captain Kangaroo, followed by CBS Morning News weekdays 7:30 to 10AM. Los Angeles and New York City (NYC) baseball uplinks seen here daytimes, evenings.

**TR17** CBS-H (Hollywood) feeds; LA uplink (WULATOC). NBC backfeeds for TODAY program 7AM to 9AM. CBS Morning News 'domestic' backfeeds 7:15-7:45AM. KRON (SF) on-air service and feeds 7PM weekdays.

**TR19/** Baltimore/Washington sports feeds uplink; WOLD 7:30PM.  
**TR21/** US AM parallel to on-air feed plus taped delay 7AM to 10AM weekdays. INN Mid-Day News fed 11:30 AM. Satellite Production Services feed to Florida intra-state stations 4PM weekdays; Special UN feeds to CNN 7:30PM.

**TR23/** Dallas KDFW (CBS) on-air-service plus feeds 7AM to 8AM. St. Louis baseball uplink; CBS (WULATOC) Los Angeles to New York City. Army medical training service continues daytimes.

**WESTAR 4 (99 west)**

For detailed coverage of regular users of this bird see CSD for May and June, 1982.

TR 1/ ABC newsfeeds to WNT (World News Tonight), 6PM.

TR 4/ CBS London feeds via Intelsat, 7AM.

TR11/ NBC Saturday Afternoon baseball.

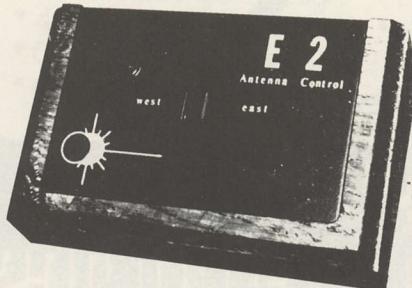
TR16/ Baseball feeds 4PM.

TR17/ CBS news feeds 5 PM.

**TR19/** Good Morning America west coast feed 10AM-12 noon. CBS Sunday, Sunday mornings at 9. America's Top 10 Sunday, 11AM.



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mornings (ET).

#### Summary —

'Routine' sporting events (i.e. summertime baseball games) are found largely on W3, with overflow to TRs 11 and 16 on W4. Uplink patterns (i.e. St. Louis on TR23, W3) may hold for days, weeks, or all summer long. Uplink sites not in use on a regular, heavy basis (several times per day) are usually left 'in place' longer than those getting heavy use.

#### CONTINUED/from page 3

precious little television anymore), but rather as an adjunct to preparing an intelligent (I hope) 24 hour per day television schedule for West Indies Video, my guide searching is more a labor of necessity than a labor of love.

Admittedly, the world would be simpler if there were but one bird to choose from. I admire the mentality at **SatGuide**. They believe there is only one bird and if you subscribe to that theory, your life is also much simpler. I admire the guts of **Satellite TV Week** because they believe anything that is up there is worth listing. Unfortunately, everytime I find something really interesting for WIV it turns out to be on Alaskan transponder 23, 1/2 transponder format service, on F2 (or is it on F1 now??). I'd be hard pressed to pick that up in Oklahoma, and from the Turks and Caicos islands I'd be better off trying to get Anchorage on the AM radio in my Blazer.

And I admire the tabular format of **Channel Guide** because it really is less of a chore to read across a table made up of little boxes than it is to dig through column after column of grey type. But, a listing that starts the day at 6:30 p.m. and runs only through 4:30 a.m. (ET) is not much good to me if I want to know what movie is featured on WOR at 4 in the afternoon.

Clearly, the guide business may be bigger and more complex than anyone realizes. SPACE has recently decided to look into printing a guide for their individual, home terminal members. As a member of the Board of Directors for SPACE, I am as anxious to find a way

to increase the grass roots support of the trade association as anyone. I am not so sure, however, that there is anyone smart enough in the entire industry to really figure out this guide business. There are a couple of computer firms that will sell you the complete (as they have it) listings for all known services. But as **Satellite TV Week** has learned, you have to individually mix in listings for services such as CBC/ANIK, and XEW and so on, which are indeed on satellite, but which are not generally tracked by computer records since these services have no cable play.

Many hundreds of cable systems now print their own guides, using as a basis the computer service listings. Since no two cable systems carry the exact same terrestrial and satellite services, every guide has a bit of customization to it. Cable firms learned early that if you provide viewers with a guide that includes listings for services the cable system does not carry, the public gets confused, then angry, and finally hostile. A satellite services guide does not have that particular problem; if the guide includes services which the satellite system owner does not have available to him, he knows the problem is that his dish does not move across the full belt. No big deal; he needs to go back to his satellite equipment dealer and purchase a motorized or moveable mount.

If getting most of the data is 'no problem' (**Satellite TV Week** proved that with their complete listings, less only at the moment the American Theater Network movies on TR19, F4), then the problem must be the **format** of the listings. The first confusion comes when you try to figure out the time zones. Just selecting a type style for the time is an apparent problem; **SatGuide** gives equal weight (type size and style) to each of the four North American time zones. **Satellite TV Week** emphasizes the pacific time zone, apparently because that is where they headquarter and that makes everything east of there 'read backwards.' **Channel Guide**'s tabular listings reads well, except for the half hour point listings which seem to run into the 'on-the-hour' listings. Nobody pays any attention to Ted Turner's 5-past 'offset' anymore and that ought to be telling Turner something about his offset ploy. It didn't buy him the individual listings he sought.

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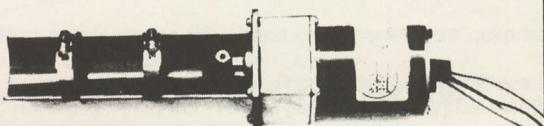
East-West Hands-On Locator



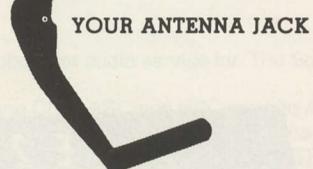
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XL10A's lightweight construction is totally unique, from its universal mount to its precision formed extruded ribs and expanded mesh surface. Even the feed rotation system has been designed for minimum aperture blockage. XL10A will remotely scan all the domestic satellites quickly and accurately, with higher C/N ratios than many larger antennas.

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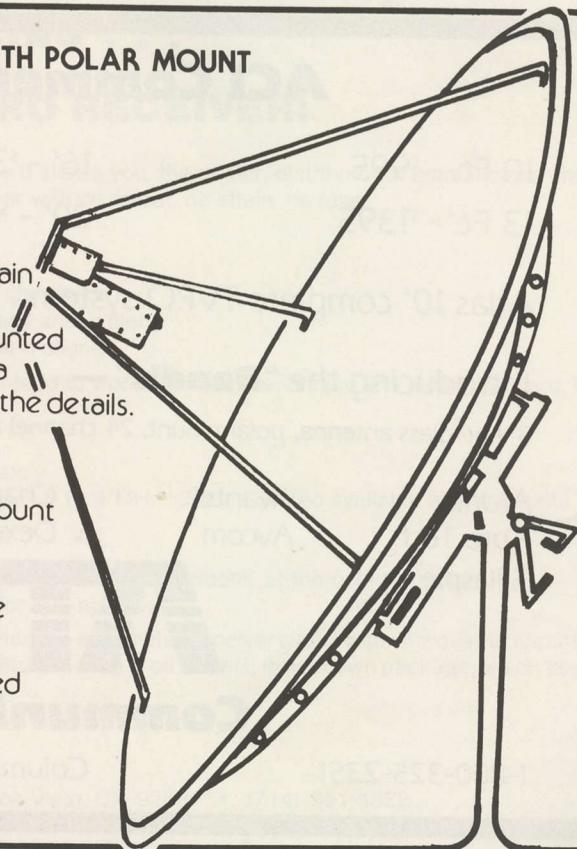
**BETA 12 FEATURES:**

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The next problem is one of utter confusion. **Satellite TV Week's** expansive listings don't miss much. But by the time you struggle through as many as 53 listings for a single time period, you are exhausted. And it will only get worse with the addition of new services. Fortunately, they don't try to list The Weather Channel, CNN-2 and others that largely repeat themselves. Perhaps, just perhaps, grouping every single service together by time slots is not the best way to do it. There are other options for grouping. Services could be grouped by satellite (i.e. everything on W4 in one listing, everything on F3R in another and so on). But that would only shorten the individual listings, not make comparative program selection any simpler. Having to flip back and forth from page to page to compare each bird's offerings at the same point in time would probably be self defeating.

You could also group by programmer category. **Channel Guide's** less-than-complete-day approach does this; from left to right you have all of the movie services, the cultural services, the odd-ball services, and then a strange mixture of the indie stations, religion and miscellaneous. In this process, **Channel Guide** also does some elementary grouping by bird.

It occurs to me that people with satellite terminals largely are category viewers. They like news, or they like sports, or they like movies . . . and so on. **SatGuide** makes a stab at this by breaking out separate sports, specials and movie listings ahead of the intermixed listings. This grouped listing approach is helpful, but by observation, the groupings are less than accurate. I suspect that the grouping is done by a human, not a computer, and that makes the group listings only as good as the person who is splitting out the categories. Movies, for example, often leave out the USA Network offerings, or WOR/WGN/WTBS films. I'm sure they are working on improving this, I know I would.

A particularly annoying section is the up-front listing of movies which adds ten to fifteen well chosen words describing the films. After they tell you what it is, what it is about, and who is in it, they tell you what the 'play dates' are for the full month. But they **neglect** to tell you which services are playing the films. The day is 24 hours long, and

there are a dozen or more services to search through after you pin down the movie you want to see. A slight bit of additional data, such as adding the services carrying that film, would be very useful. The same listing ignores WOR/WGN/WTBS/USA Network, CBN movies. They provide this data, usually (but not always), in the master listings. Since the movie service movies repeat over and over (and over), relisting the same basic data about each is certainly not a good use of paper or space. I agree that one listing in front is adequate, **provided** we can go back to the front and find some reference to the services carrying those movies.

The people at United Video and Ted Turner have addressed this listing problem. Both have created innovative text/data systems to allow the listing information to be transmitted as vertical interval data. WGN is up and running with their system, on a 'semi-test' mode, on TR3, F3R. Turner is still trying to get his into gear. Both of these services want to send **individually addressed** data to **individual cable systems**, for display on an otherwise unused channel. That means that both of these electronic guides will be less than complete for **all-service** viewing, since they will largely simply replace the printed, individual cable system, customized guides now being distributed.

Into this frey, as noted, **SPACE** wants to jump. I support their desire to increase individual memberships by going after the tens of thousands of individual terminal owners. But I wonder, does **SPACE** **really** know just how complex and cumbersome this problem really is? Another guide, no more complete than those already in the marketplace, no more usable for the average viewer than those already in the marketplace, will not attract the thousands of home terminal viewers **SPACE** needs in the membership. If this was a simple problem, somebody would already be doing it the 'right way.' It is not a simple problem, and as best we can tell, nobody yet has been smart enough to figure out 'the right way' to do it.

#### **SENATOR GOLDWATER**

There is a group of concerned people in the home TVRO industry who feel that Arizona Senator Barry Goldwater may have lost control

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of his staff. The issue before the court is a bill proposed by Goldwater which sounds very much like the "do something for everyone" Communications Act re-write of 1982. The Arizona Senator has a unique background to equip him for dealing with communication matters. He has had a life long interest in electronics and communications, is a very active amateur radio operator, and spends whatever free time a busy Senator might have tinkering around with the same sort of stuff that people in our industry do.

Under or via Goldwater's name, has come a new bill which would just about completely rewrite the broadcast and communication industries of this nation. Largely, it would free up those who make a profit from the airwaves, reduce the technical bottlenecks which prevent many otherwise capable or interested people from becoming licensed hams, and do away with such things as CB licensing. It is hard to hang a single label on the proposed legislation, but overall it attempts to cut back on the red tape of communications bureaucracy and to replace that red tape with automatic go/no-go situations. If you qualify, you go. If you don't, you find a way to qualify.

The bill is probably trying to do too much at one time. It is probably getting so all inclusive and so all complicated that even the Senator has lost control of its original intent. And into this omnibus bill someone (members of his staff are being blamed) has snuck in language which sounds almost exactly like the language which Waxman has been trying to float over on the House side. In short, a section of the bill would make it illegal to use a home terminal the way most users now use home terminals.

**SPACE is on top of this new attack**, and we trust that they will see that Senator Goldwater hears a straight message. Early indications are that Senator Goldwater got the bill started in his staff, and then left it to the staff to 'polish.' And they polished it after talking with their private contacts from groups such as MPAA, HBO and so on. It is probably far easier to 'get to' a Senator's staff member than it is to get to a Senator.

Just for the record, it was one year ago that several of us had direct contact with Senator Barry Goldwater on the question of home (private) satellite terminals. Quite a few of us heard back, in writing, from

BARRY GOLDWATER  
ARIZONA

United States Senate  
WASHINGTON, D.C. 20510

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INDIAN AFFAIRS

May 19, 1981

Mr. Edward Grotzsky, President  
Arunta Engineering Company  
Box 15082  
Phoenix, Arizona 85060

Dear Mr. Grotzsky:

Frankly, I don't think Congressman Waxman's bill would be Constitutional. I have discussed this with quite a few lawyers and all of them are of the opinion that it is extremely difficult if not impossible to regulate the reception of television signals or any other signals from stationary satellites. I will certainly oppose this if anything comes of it.

By the way, could you send me a price list of the different things you make for TV reception? I have been quite interested in putting one together myself.

Sincerely,

*Barry Goldwater*  
Barry Goldwater

the Senator. At his request we rounded up a complete set of all issues of **CSD** through May of 1981, and dispatched the set to his office. He found time to read most of them.

Appearing here is a typical letter, sent to a concerned home satellite industry person, by the Senator. The key line is found at the end of the first paragraph. Read it over and then if you hear that Senator Goldwater is being led down some foreign trail by members of his staff, you'll be armed with a quote from his own May 19, 1981 letter to write him yourself.

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### MORE RESULTS/Down South

Several terminals in the 6 meter size range were recently installed by a well known industry supplier in northern South America; Colombia, to be precise. These were the first such terminals to 'go in' since F3R flew, and the new W4 bird was operational.

Last month in **CSD** we presented some FCC filed EIRP coverage maps, which we had translated to antenna sizes. A few of our internationally minded readers undoubtedly studied the forecast footprints as they related to South America. Based upon the recent results in Colombia, and elsewhere in northern South America, we have some new, updated thoughts on all of this. If you have an interest in bringing US (or Canadian!) television to this part of the western hemisphere, you will probably like what follows.

In **Medellin**, northern Colombia, a six meter (**Hero**) dish equipped with an 80 degree LNA and a 'stock' AVCOM receiver produced the following results:

- 1) Transponders 3, 7, 11, 15, 19 and 23 were totally 'out of the sparklies.' All were above threshold.
- 2) Transponders 4, 8, 12, 16, 20 and 24 were at or just above threshold (the verticals were 'well' above), and very good quality.
- 3) The balance of the transponders were from 3 to 6 dB below the horizontal set identified previously; most were 'watchable' but not of high quality.

**All of this from F3R.** From F1, where Wold has recently shifted the previously on F2 (TR8) AFRTS feeds going to Alaska, on TR8, the feed is at or just below the threshold level; very light sparklies.

From **ANIK B**, all of the active Canadian video transponders have about the same level as the 'balance of' transponders on F3R; 3 to 6 dB below threshold, watchable, but not perfect by any means. Medellin is hardly close to the Canadian bird's boresight!

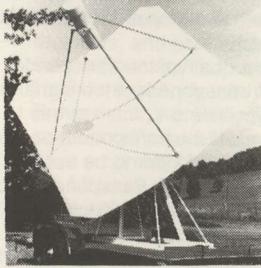
And then the really big surprise; the service from Westar 4. Now Western Union has always done an excellent job of keeping their signals **confined** to the forecast footprint areas. They have missed the mark with at least half of their transponders on W4, and people throughout the southern Caribbean, and northern South America, should be delighted with the results.

At **Medellin**, transponders 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22 and 24 are all **well above** threshold; **no sparklies**. This would indicate an EIRP in the 29 dBw region, at least. Western Union, on their EIRP maps on file with the FCC, forecast a number in the region of 17 to 18 dBw. A difference of more than 10 dB is hardly a small 'error.' And, it is worth noting that included in the (vertical) transponders seen on the six meter terminal are (presently) a pair of SIN/XEW (Spanish language) transponders, plus, the Galavision (Spanish language pay service) feed. This is of considerable attraction to the area reached.

Moving on, the Wester 3 signals are mere 'traces' and not viewable. The results with SATCOM F4 are again puzzling. It had been prognosticated by **CSD** that F4 would probably have very closely defined contour lines south of approximately 21 degrees north, because of its 'head-on' look angle back at North America. This should suggest that however poor the results, they would be fairly uniform from transponder to transponder. At Medellin, signals are **on a par** with the **poorest** service channels **on F3R**. There is a very slight edge in favor of TR7 in Medellin, which in theory should be one of the 8.5 watt transponders.

What does all of this tell us? Well, between the expanded F3R coverage and the unexpected W4 coverage into northern South America, there is suddenly a bright, new marketplace for modest (six meter, and perhaps smaller) terminals. We did some checking with some satellite design folks at Hughes Aircraft on this topic and jointly came to a conclusion which at the moment is pure theory. That being, if the F3R and W4 antennas, as reported here, are providing the levels of service as has been measured in Medellin, there is probably useful service **much-much further to the south**. How far east of Medellin it extends is **another** theory; it could go either way. One Hughes satellite transmitting antenna designer suggested that you may be able to go as much as 1,200 to even 2,000 miles **further south** from Medellin (you can do your own map measuring), and still have signals that are useful and viewable on dishes in the 9 meter range, from F3R and W4. If this is the case, a substantial new area would then open up for US television via at least these two birds. Another Hughes person suggested that the **ANIK B** signals, while not

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**KLM Sky Eye IV**  
24 Channel Receiver / Down  
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**Avantek 120°**  
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System Price **\$1989\***

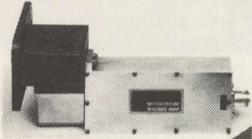
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**California Amplifier**  
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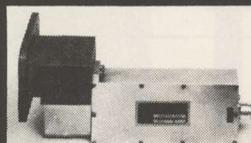
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high quality, apparently could be expected to also extend far to the south at about the same level as they are seen in Medellin. With a new 24 channel ANIK bird coming on line late this year, and with the known antenna design criteria which similar birds exhibit, there could well be greatly improved (and enlarged) Canadian service coming for viewers in the South American area.

Finally this international note from Medellin. Yes, the Ghorizont 2 signal is super strong; the strongest signal of any seen (including those from F3R and W4 which are above threshold). Additionally, the Argentine service recently activated on Intelsat is excellent in PAL N format, transponder 24 (US channelization), 1/2 transponder format. And that, also, is a Spanish language channel. Things are, indeed, looking up for private and commercial terminal sales in at least the **western** Caribbean and those portions of South America bordering on that sea area!

#### HALF TRANSPONDER RECEIVERS

There is a considerable amount of confusion about concerning how the Intelsat birds differ from our domestic birds. We've covered that subject pretty extensively, even as recently as the May (1982) issue. What seems to bother people the most is the way Intelsat birds divide the typical transponder in half and then send a separate set of video in both halves, or, video in one half and data and voice communications in the second half. No, that is not the same as running video in the full transponder and sticking in one or more audio sub-carriers.

Bob Behar at Hero Communications in Hialeah, Florida has been doing extensive work in this area, because his non-US customers are demanding good quality video on their Intelsat feeds. That's no easy trick with a 20 foot dish, on most of the Intelsat Global (22 dBw **maximum**) or hemispheric (26.5 dBw **maximum**) signals.

Here are the basic problems.

- 1) A transponder loaded into a hemispheric antenna beam will cover (say) all of the area west of the satellite's location. The boresight or center of the beam has a theoretical maximum

footprint signal level of + 26.5 dBw if everything is cranked up full bore.

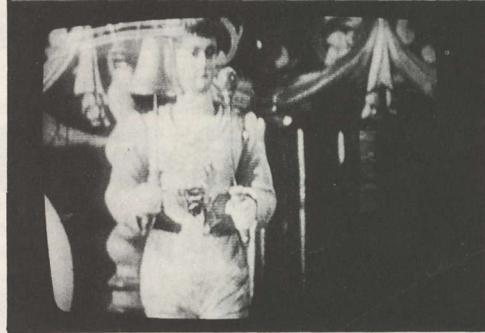
- 2) Now, if Intelsat decides they want to only allow half of the transponder to be used for video (and its accompanying audio sub-carrier), then the uplink video signal is now reduced in frequency swing (FMing), from a 30 to 36 MHz wide signal, to a 14 to 18 MHz wide signal. They center this 'half transponder signal' in either the **lower** half, or the **upper** half, of the normal transponder and that makes the middle of the normal transponder assignment, where the carrier normally sits, now the upper edge of the lower half, and the lower edge of the upper half. That tells you that to tune in the half transponder signal, so it is 'centered' on your discriminator, you have to tune (fine tune) your receiver to the center of the half transponder wide carrier; not the center of the transponder.
- 3) Next, if they plan to use the 'other half' of the transponder for anything, whether another half transponder video signal or a bunch of SCPC channels, or you name it, Intelsat has to go through a process called 'backing off' the transponder power. If they allowed both halves of the transponder to be used at full power, they would then be overloading the transponder. So to accommodate half transponder signals, they reduce the uplink power (which reduces the downlink power and EIRP) by no less than 3.0 dB. That now says the **maximum** boresight EIRP for a half transponder Intelsat signal is 26.5 minus 3 or 23.5 dBw. Yes, that is starting to get frightfully weak, even for a 20 foot antenna and a good LNA.
- 4) Which brings us to the receiver. There is not much you can do about the half transponder (working) format; Intelsat finds it spectrum efficient, and they typically have the big, as in huge, dishes to support such power back offs. But at **your** receiver, there is something you can do. With the half transponder signal now only half as wide as a normal signal, and with it off-centered either low or high by 10 MHz (to re-locate to the center of the half, rather than the center of the 'whole'), you shift your

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fine tuning to re-match the center of your IF to the center of their signal. This allows your discriminator to track the off-set signal, and hopefully recover some video. But alas, your IF is at least 25 MHz wide, and it could be as much as 36 MHz wide; a function of the receiver design type you are using. If you sit there center tuned on a half transponder signal, you are going to have noise, even garbage, from the other half (in your IF) at the same time. It is bad enough the signal is weak, but now you have one desired and one non-desired signal in the same IF at the same time. This is an effect **similar** to parking your LNA and feed rotation about half way between the vertical and horizontal polarizations on a domestic bird. You recover some signal from both poles, simultaneously.

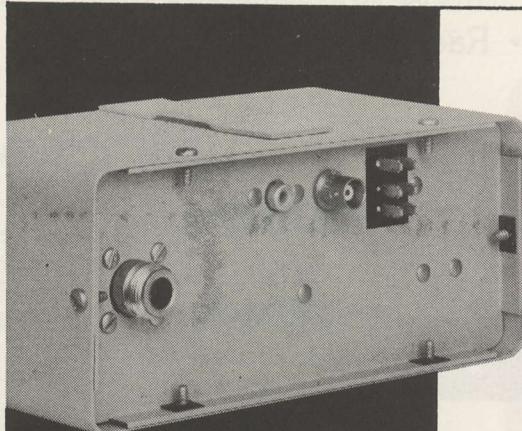
5) Recently Bob Behar went into one of the popular AVCOM receivers, and created his own series of modifications. He did this without any approval from AVCOM master pilot Andy Hatfield, and Andy tells us that he is not ready to sanction the Behar mods, yet. Basically, Behar takes a second IF and using some small coaxial relays gives his receiver a choice; it can have a normal AVCOM-width IF, or, a half transponder width (15 MHz) IF. Next Behar found that the discriminator system used in the AVCOM can be 'tweaked' for the half transponder format to produce considerably better demodulated video. He wired all of this together with front panel switches so the user is not fumbling with a plastic tuning tool or plugging and unplugging cables each time he comes across a half transponder format signal. So how well does it work?

When we were in Miami putting the magazine together we went by Behar's office to see. And we took some pictures of the results. Our observation is as follows. Behar swung a six meter Hero dish through the eastern sky and we counted four half transponder format video signals 'up' at that instance. We could make out people on one of these (Brasil), but that was about it. Then he switched to the modified AVCOM and we swept the birds again. Now we counted seven half transponder signals, and three of those were of good quality and very

watchable. The Brasil feed and a French feed were particularly good. Until they went to color bars. Then we saw the bad side of tweaking on the AVCOM discriminator. The color bars looked just terrible; especially in the red end. But the same transponder in programming looked very decent indeed.



I came away from that session feeling that there is a great deal of room for improvement with half transponder receiver systems. I'm well aware that when you buy an Intelsat receiver equipped with switchable half or full transponder video, you expect to pay upwards of \$12,000. Bob Behar has jumped in to find a solution because he has customers yelling for better performance under half transponder conditions. Unfortunately, it is only in the southeastern corner of the USA where you can 'see' a reasonable variety of half transponder signals on a regular basis. There are a pair now operating at 53 degrees west; the Intelsat bird on loan to Mexico for its domestic system now has tens of hours of programming per day at that easy-to-see location, in



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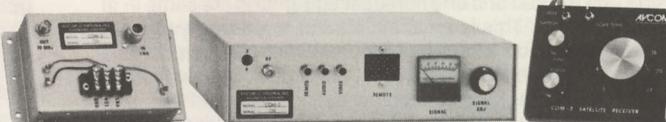
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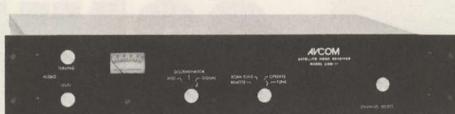
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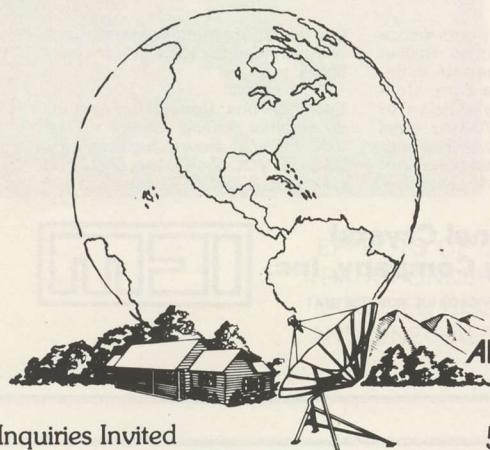
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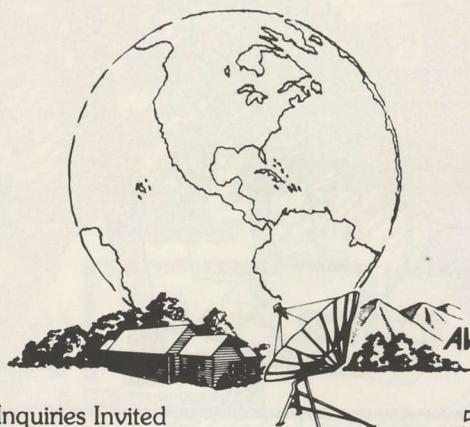
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the half transponder format, on transponders 1 and (typically) 7. This is one area where somebody with some time on their hands, and a reasonable background in receiver circuits, can sit down and take the big bucks out of commercial gear. Design us a box that can go in with suitable switching as a second 70 MHz IF strip. One that not only narrows up the IF, but which (based upon some complex discriminator theory) optimizes the demodulation function for a (relatively) narrow band deviation index.

Marketing such a 'box' would best be done at the outset by offering it as an option that could go into virtually anyone's 70 MHz IF receiver. Later on, it would start appearing as a built-in option in receivers. The market for such an attachment is probably not large, just yet, but give us another year or so and somebody could be shipping several hundred per month. Which is not a bad way to pay for your house!

#### AUDIO CHALLENGES

If you have tuned around Westar Four, transponder 3, you may be wondering what all of that strange sounding audio (it is audio, isn't it?) is doing there. There are now three Mutual radio Network audio channels there, as many as eight PBS (NPR) audio channels, a couple Robert Wold leases out, and a couple more used by ABC and others. If you tune them in using a communications receiver connected to the video output on your TVRO receiver, you quickly decide they are not single sideband (SSB). If you switch to AM, you can almost slope-detect them and determine that you are dealing with FM. But, if you take a tuneable audio system such as the Arunta SSP-312 and attempt to bring out the FM, it sounds very poor indeed. So what is going on here. Are they 'scrambling' this audio?

Not on purpose. What NPR and the rest are doing is 'compandering' their audio. That's a process developed nearly two decades ago to compress the audio bandwidth into something far too narrow for normal audio. They actually 'stack,' by overlaying the audio spectrum of the audio channel, on top of itself. Yes, it takes some electronic magic to undo all of this.

I recently saw where at least one firm that produces IC devices has come out with a device that does most of what has to be done in a

single IC. David Barker explained to me how such a receiver processing system might be built. Naturally I felt I had to have one since decent audio services are even harder to find than decent television feeds, down here in the Caribbean.

Alas, my own time is extremely limited at the moment so I am issuing an appeal for somebody who has already developed a system to de-compander the compressed FM transmitted systems to share it with all of us here in **CSD**. On the slight chance that this has not yet been done, perhaps you'd like to tackle it for a weekend project. I've mentioned it to several people and feel there is something less than intense interest in such a system at the moment. But to those of us who enjoy good, clean, audio feeds, it would be a very useful box. Anyone want to tackle it? It would certainly make excellent reading here in **CSD**!

#### THE NEXT WAR WILL BE IN PRIME TIME

It has been just long enough since the last major international confrontation that in the interim the development of satellites has come a long ways. This was driven home to satellite watchers during the early days of the Falklands dispute. With the recent transfer (at the time) of much of the Westar 3 traffic over to W4, and the development of W4 as a bird largely devoted to 'regularly scheduled' services, the load fell on W3. You could open each day (starting around 7 AM eastern) with a series of feeds (TR3 typically) from CBS London, The Sheraton BA (Buenos Aires) and even from British ships at sea as they began their long journey from the UK to the far south Atlantic. The feeds came across the Atlantic on Intelsat but after arriving in Maine were relayed onto New York (and elsewhere) via Westar 3. It is always educational to watch the news folks doing their feeds over and over (to get it right), or to observe while CNN fills its allotted time from the Sheraton BA and then the news type has to scoot off camera to allow the CBS or NBC counterpart to move in. It was apparent they were stuck into a corner of a small room at the Buenos Aires Sheraton, forced to jury-rig rear screen projection from a slide bank to allow each to have a customized background. They were pretty good about finding the right background slide for each of the respective network

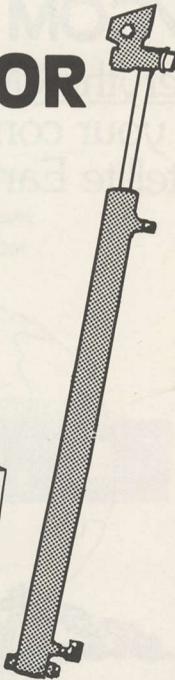
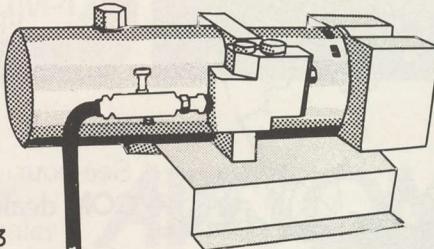
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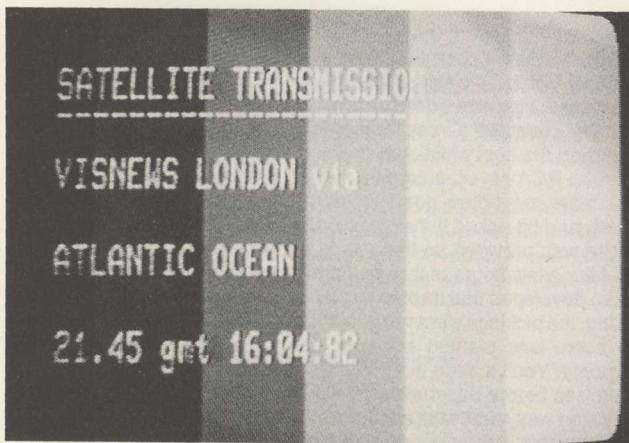
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newsmen the first few days, and then in the rush of getting the reports on the bird, they would overlook this detail and CBS would end up with the CNN background, or NBC would run with a white (lamp lit) slide screen behind the newsmen, and no slide in the projector. One of the classic feeds had two well endowed young ladies pouring what appeared to be champagne on the newscaster's receding hairline, while the familiar-to-everyone newscaster re-said the famous phrase "War is Hell." This particular one never made the network news.

The London VISNEWS and ITN feeds were particularly interesting because CNN or CBS would simply jack into their local London off-air receiver and send the whole newscast to the USA; at least up to the point where they began the overnight cricket scores.

One memorable feed had CNN's Boetcher trying to explain how the newly imposed Argentine censorship worked. He was obviously trying to say things which would slide by the censor, and he was getting grilled from the two anchor folks at CNN in Atlanta. They were not sharp enough, or they were just mean enough, to keep pushing

him on the issue of what censorship **really** met. Finally he blurted out something which even a 10 year old Argentine censor would have snipped out, and having said it, said "Now . . . if you heard that, I am not being censored. If you did not hear that, then now you know what censorship is all about." That one, too, never made the CNN newscasts.

If the world powers will hold off another couple of years, we'll have 12 GHz uplinks on back packs that can be parachuted with newscaster and ultra-mini-cam into wherever the action is. It will be just like the Russian Mercury probe. We'll get about four minutes of fantastic video, unedited, before the enemy forces capture the newsmen and destroy him and his backpack. I hope the network folks are smart enough to schedule the next war for prime time. Getting up in the middle of the night to catch all of this good stuff is hard on the viewer!

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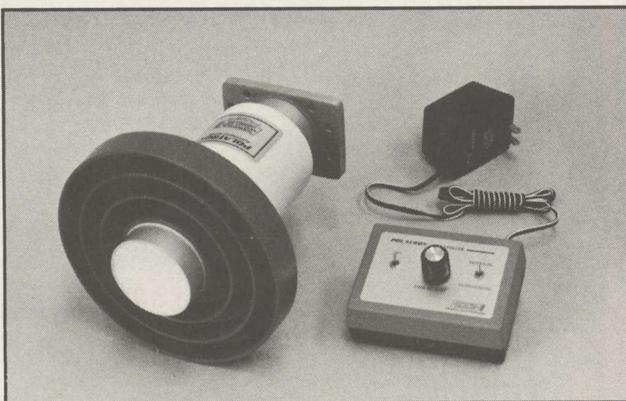


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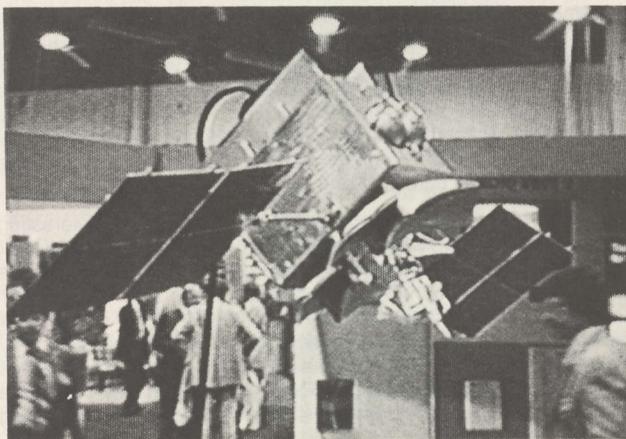
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CableNet II (F4) bird, the folks at RCA moved both an uplink system and the traditional downlink into their booth at the Las Vegas, Nevada National Cable Television Association (NCTA) show early in May. If you were dialing around the backwaters of not-very-interesting F4 you possibly stumbled across their feed on vertical transponder 23.

Using the best of RCA everything, including a modern TK series camera, RCA set up a camera in their own booth. The concept was that cable convention goers would be shown on camera in the RCA booth, and be asked if they wanted to be 'sent via satellite.' A microphone was provided so they could announce who they were.

After a few hours of this the camera person, (who apparently was male) developed that traditional stance of following young (and not so young; the pickings were not good!) ladies up and down the aisles with his zoom lens planted squarely in some appropriate part of their anatomy. You've seen the same thing dozens of times at the set up exercises before baseball (etc.) events. Using their 300 to 1 zooms, they start way across the stadium and zero in on the 44 inch girl in a 36 inch sweater.



RCA kept this up for days, and you got occasional glimpses of nearby booths (Times Fiber, M/A Com). But very few (cable or other) people. Most of the time the RCA sales people were standing around playing with their badges, waving to themselves in the downlink monitor and generally wishing they were at a party on the sixth floor of the Sahara.

RCA wanted people to be aware of the CableNet II service. They would have done better with their money by renting some old Roy Rogers flicks and filling the bird up with 24 signals. There is just nothing there yet to attract most cable systems, and seeing themselves on live satellite television did little to change that fact. However, it was an interesting way to waste a few ten-thou. I suggest we all insist that Rick Schneringer have an uplink at his next show so that we too can 'wave to momma' back in Tennessee. It's hard to believe that the guy that thought this one up probably has a base paycheck of more than \$75,000 a year. Good grief. These are our leaders!

## MODULATORS/Again

In the May CSD we wrote that a firm in Arkansas (Power Consultants) had apparently slipped one past the Commission by obtaining FCC certification for a 'stand alone' RF Modulator. Previous to that, in our January issue of CSD, we had written that there was no way for a stand alone RF modulator to be granted FCC approval for sale, pending completion of a long pending FCC rule making on the subject of 'low power' TV modulators and associated apparatus.

The FCC grant is shown here. We didn't have it available back in May, and since most of you probably have never seen such a piece of paper, we thought you might be intrigued what all of the fuss is over.

FEDERAL COMMUNICATIONS COMMISSION  
WASHINGTON, D.C. 2054

GRANT OF EQUIPMENT AUTHORIZATION  
CERTIFICATION

Power Consultants, Inc.  
1503 Breckinridge  
Little Rock, AR 72207  
Attention: John Cryer

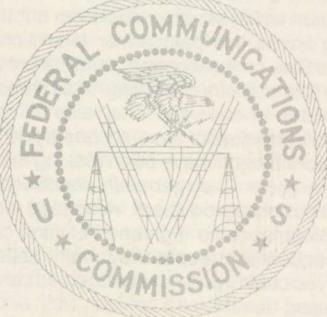
Date of Grant: October 2, 1981  
File No.: 31010/EQU-4-3-18  
Application dated: June 4, 1981

**NOT TRANSFERABLE**  
EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER	BS98XUR310A
Name of Grantee	Power Consultants, Inc.
Manufacturer	Power Consultants, Inc. (USA)

FCC Rules Part: 15  
Equipment Class: TV Interface Device (RF Modulator) (Channel 3 or 4)

#81-2026  
PI:ss



In correspondence concerning this grant, please refer to the FCC IDENTIFIER, File No., and date of grant.

PL  
FCC Form 731A  
September 1979

There are numerous TV modulators offered for sale (as in, advertised) in this issue of CSD. Strictly speaking, most (or almost all) of them probably are illegal. We lamented that there was apparently no way to get them legal (see January CSD), and then fish-tailed slightly (May CSD) when it became apparent that John Cryer had gotten such approval. But we were still confused until we received a letter from Ronald E. Wysong, Executive VP at the RL Drake Company. Mr. Wysong has done his homework, and while some parts of his letter are proprietary in nature, I doubt he will object too violently if I use other parts to attempt to set this mess into FCC-perspective. He notes "Statements you made in both issues (January and May CSD) are true. A stand alone modulator cannot be certified per existing Class I TV Device rules. A built-in modulator can be certified but would be a very costly device due to the very stringent radiation and conducted levels required (by the FCC). The good news (and this is known and understood by very few) is that any modulator (built-in, stand alone, or even a kit) can be certified (not 'approved,' staying with FCC terminology) per the Proposed Rules and Regulations in Docket 479-244 (Amendment of Part 15 of the Commission Rules to provide for the operation of a TV Interface Device). The key words are TV Interface Device, which is (FCC) defined as

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There is a technique one goes through to submit a modulator for certification. RL Drake Company recently went through this, and it cost them dozens (perhaps hundreds) of hours of time, and big bucks, to get the job done. It would not be far for me to tell others precisely how to do it since that would put Drake in the strange position of paying for competitor's "Legal R and D." I do thank Mr. Wysong for educating me on the technique. In return, I promise to tell him how you apply for a national television network license in the Turks and Caicos islands, the next time we meet. The two tasks are roughly similar!

There is this point that should be made, for those who think that a TV Interface Device approved by the Commission is an easy 'end run' around the FCC rules. There is **more** to the approval and subsequent selling of the device than merely getting an approval number to stamp on the product. **To be totally legal**, even after certification, the units **must** be supplied to the consumer with **all** necessary hardware allowing the consumer to make the **total** hook up. That means **all cables**, connectors in place, and **even an 'A/B' switch** to select between the output of the (modulator) Interface Device and the normal TV antenna. Lacking all of these fine points, **plus** a well prepared set of hook-up instructions with plenty of diagrams, the device certified by the FCC can have that certification 'lifted' by the Commission with no notice. If you are in the modulator business, as a manufacturer or distributor or dealer, be advised. Competition is coming, and doing less than a complete job (i.e. not following **ALL** of the FCC rules) could get you in plenty of hot water.

### **NETWORKS DOWN/History Up**

You may have missed it. The network newscasts didn't mention it. It did get some air play on CNN, however. And **Entertainment Tonight** spent quite a few minutes giving out the numbers.

Depending upon which set of numbers are quoted, it appears that network viewing habits this past winter television season hit new lows. They tell us that, on the average, network programs were down as much as 9% (the combined viewing of all three networks, by all families, nationwide). In one year. They also tell us that in the past few years, network newscasts have slipped by 12% overall.

Now the network moguls have been making fun of the 'new technologies' for many years. They generally dismissed cable viewing as something not to be concerned about, video tape recorders and video discs as something not to be frightened of, and cable satellite services as inconsequential. I doubt they really believed these grand statements, but you could hardly expect them to come out forecasting their own doom and demise.

Over in the 'cable camp,' only the foolhardy have been speaking out about the inroads cable has been making. Let me take that back. Only Ted Turner, and the foolhardy. Ted has been on the 'network case' for several years. He plainly does not like network mentality. Cable people are not dumb; if they were out there forecasting the doom of networks (which will take with it the affiliates), and Congress and the FCC believed such statements, the cable folks would in short order be faced with new legislative threats, new FCC regulations and a myriad of other problems designed to stunt cable growth. So cable has played it 'cool.'

Well, the audience measuring systems are not perfect but they do a pretty fair job of tracing 'trends.' And the past couple of years there has been a gradual, measureable downward trend for network viewing. HBO has cleanly won audience races, **over** ABC, CBS and NBC, in cable homes where the movie service is available, in a number of markets. HBO quietly showed those numbers around, but wisely didn't make a big thing of it. Audience numbers are used to sell advertising, and for now, HBO does not carry advertising.

The drop this winter, however, has been much sharper than expected. The networks are plainly in trouble. Big trouble. I think they know this, and that's why we see CBS involved with a cultural cable project, ABC involved in their version of culture plus a competitive-to-Turner news service plus a loose arrangement with ESPN. NBC has launched RCTV. All have additional transponders reserved, and CBS recently won FCC approval to own and operate cable systems (prior FCC regulations prohibited such network ownership).

The networks have had a good run of 30 years or so. That is

longer than many of the younger satellite industry participants have been living, and longer than most of us can remember. Now it happens that several years ago (1975 to be exact) I was involved in a 'crash project' to tabulate and set down in print the history of the American FCC-regulated television industry in the United States. The scenario was like this.

**Segments** of the cable industry were incensed that the FCC had taken over regulation of cable. They wanted Congress to redress the situation. To make a case before Congress, somebody had to carefully research the FCC's handling of cable (and broadcast TV), and prepare a 'document' that spelled out what had happened from 1941 onward. I was elected, and for the next 2,000 hours or so I spent every waking moment reading thousands of old magazines, FCC documents, letters, newspapers and researching the FCC handling of the development of television in America.

Then, through **CATJ** magazine, we released the study. It took two issues to say or tell it all, and we devoted virtually every editorial inch in both issues to the topic. In the process, unknowingly, I wrote what turned out to be one of the few definitive histories of early television broadcasting in the USA. Not everyone liked it, of course. But I received nearly 150 letters from Congressmen and Senators who thanked us for preparing the study, and a few of those communiques did say nice things about our work. I think this report played a substantive part in getting the FCC to back off on over-regulation of 'small' cable TV systems in the following years.

When I heard the 'news' that the networks are in **real** trouble, I had mixed feelings. I remember the first television I ever saw (Kate Smith), and the first newscast I ever saw (John Cameron Swayzee). I grew up on the networks, and in addition to being on 'Super Circus' in 1950 as a child, and being a member of the J. Fred Muggs fan club, I got hooked on TV by building my own neighborhood cable system in 1951.

While talking on the telephone with a 30'ish industry executive recently, I asked him how he felt about the networks losing ground. "**They've got it coming**" was the response. I felt the answer was superficial, and showed very little insight into the rich history and lore of ALL of the television industry. I wondered how the people who are leading the 'next' revolution (home terminals) could be painlessly taught the history of **all** of television. I don't see how anyone can be active in the industry we are in, and understand what is **really** happening, without some foundation in what happened before satellites.

Then it occurred to me that the March and April 1975 issues of **CATJ** were the answer. I did it all then, and while I didn't know that those were the last of the good old days for network TV (the first US satellite had just gone 'up'), looking back now, it is all crystal clear.

So this month I am exercising my personal copyright on the **CATJ** material, and dragging out those two (collector item) issues. I promise not to overfill **CSD** with this replay of history, but it is now apparent to me that in the next 24 months we are going to witness the crumbling of three institutions; ABC, CBS and NBC. No, they will not go out of business, nor will they falter and fail. But they will be hard pushed to stay alive, and they will reluctantly change the way they do business. I believe they will greatly accelerate their move to satellite distribution, and re-arrange the way they feed programs to affiliates.

**The affiliates are the key here.** If the affiliates find themselves being dragged down by slipping network program ratings, the affiliates will go 'program shopping.' The best shopping center for affiliates will be the satellites. The 1981-82 season start up of programs such as **Entertainment Tonight**, **Solid Gold** and others being fed 'independently' to dish equipped broadcast stations was the mere tip of the iceberg. We'll see a considerable increase in this type of satellite use in the next 12 months, and I doubt any but a handful of network affiliates will be 'dish-less' one year from today. They cannot afford to miss out on what the satellites have to offer.

NBC recently said they would need 12 dedicated satellite transponders by 1986 or so. They also said that they would use 7 of those on a daily basis, and hold the other 5 for special days like Sunday; pro football feeds. You can play all sorts of games trying to carve up on paper how NBC **thinks** they might use 7 fulltime transponders. One for fulltime news, six for program feeds. Since they group ET and CT together, and MT and PT together for program release, that says they could feed the same program twice on two transponders, and

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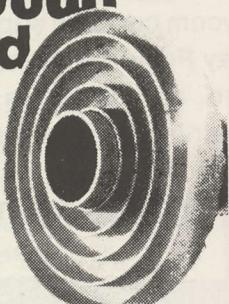


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cover the time zone problem. If they want to dedicate six to program feeds, that might suggest three separate feeds. Simultaneously, NBC isn't talking of course.

You may recall that some years ago, with moderate flack, ABC launched a set of four **radio** network feeds. There is nothing that says that NBC couldn't feed three separate programs at the same time, and allow affiliates to take any of the three. And where the local affiliate elected 'feed A,' and passed on 'B' and 'C,' there is nothing to stop the network from selling off 'B' and 'C' directly to the local cable TV system where there are plenty of spare channels kicking around. If NBC, CBS and ABC are suffering a downturn in viewers because the viewers suddenly have **more to select from**, one of the better business answers would be for the networks to double or triple or quadruple their own outputs. Being one of **three** (ABC, CBS, NBC), as in the good old days, is one thing. Being one of **53** is quite another.

I doubt anyone who has come into the television industry in the past ten or even twenty years can appreciate the magnitude of this change. The ramifications run the gamut from how Proctor and Gamble sells soap to how politicians sell themselves. From how we bury Presidents to how we perceive international news events. The very fiber, and fabric, of American life is changing because of the communications revolution. Just ten years ago, three Americans in five were employed by industry. Today, only one in five is so employed. What happened to the other two? They have dropped out of the work force, or, they have been swallowed by the so-called 'service industries.' If you are a dealer or distributor of T.V.R.O.s, you are in the service industry category.

If you want to stay there, stay profitable, and stay ahead of the rapid fire changes, you've got to be well informed and able to judge the events of today and tomorrow in the historical perspective of how the foundation for all of this got started. That's why we are starting what may seem to many as a waste of **CSD** space this month. A look, back, at the roots of all of this change. It all happened decades ago, and via the re-look at the **CATJ** series of March and April 1975, you are (as Edward R. Morrow used to say) 'there.'

**ET TU ABC?**

I have to hand it to ABC. They are one aggressive outfit. While they continue to tell their affiliates and Wall Street that cable is a dirty, no-good bunch of thieves, they are plunging in with their own satellite news service (with Westinghouse), playing around (and losing money) with ARTS, partnering with Hearst with daytime women's programming, and wheeling and dealing with ESPN on sports.

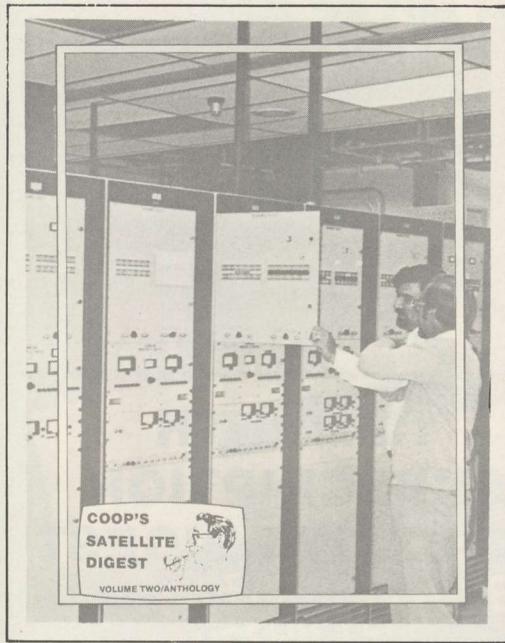
Now they have tackled HBO et al head on. By feeding to their affiliates a late-late night first run movie service, which the affiliates will scramble, ABC is going after the home VCR market. It will work this way.

Your local ABC affiliate will (if they choose) carry movies fed to them from ABC. These movies will be of the same genre as those HBO et al now release. Your local affiliate will scramble their transmissions using a new bit of Sony technology. You will pay something like \$20 to \$30 per month to get a descrambler box which will allow the movie service, fed between say 2 a.m. and 6 a.m., to either be viewed live or (more likely) recorded for you on your home VCR while you are asleep.

It's a pretty good ploy. It puts ABC in the position of having a leg up on distributing movies to America; movies which the network could not buy and show in 'prime time.' It also puts ABC in bed with people such as the first run movie distribution folks, Sony, and it may help take some of the heat off from nervous affiliates who by now are wondering where they will be banking five years hence.

**But will it work?** Will people pay money to watch movies they record themselves on their home VCR decks when the same movies are or shortly will be available to them on HBO or The Movie Channel (et al)? What is missing in the ABC scrambled movie mix is the word 'unique.' What ABC is doing is putting in a national movie theater, a sort of national MDS service. But they are only doing it on a different channel, at a different time. For now, it will have a short term advantage because of the reach of the ABC over-the-air affiliates. For the long run, it looks like a loser. It will be interesting to see how ABC matures the service as the penetration of cable, and eventually home satellite terminals, grows.

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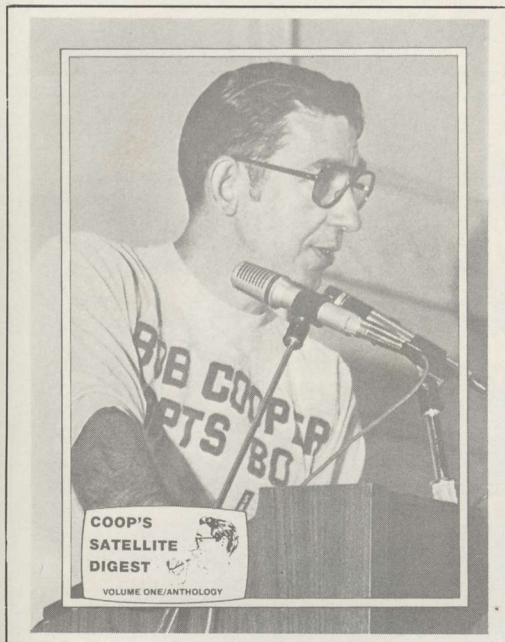


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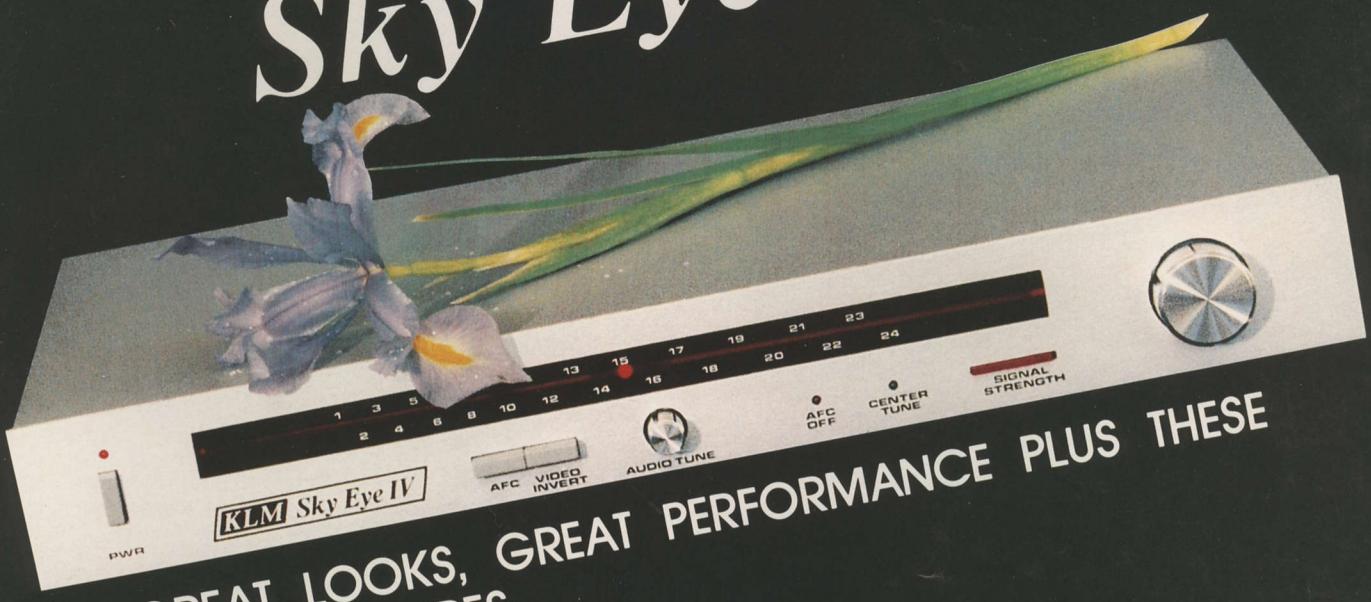
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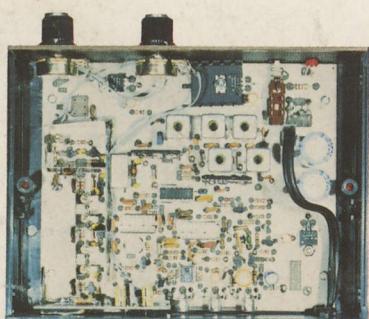
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